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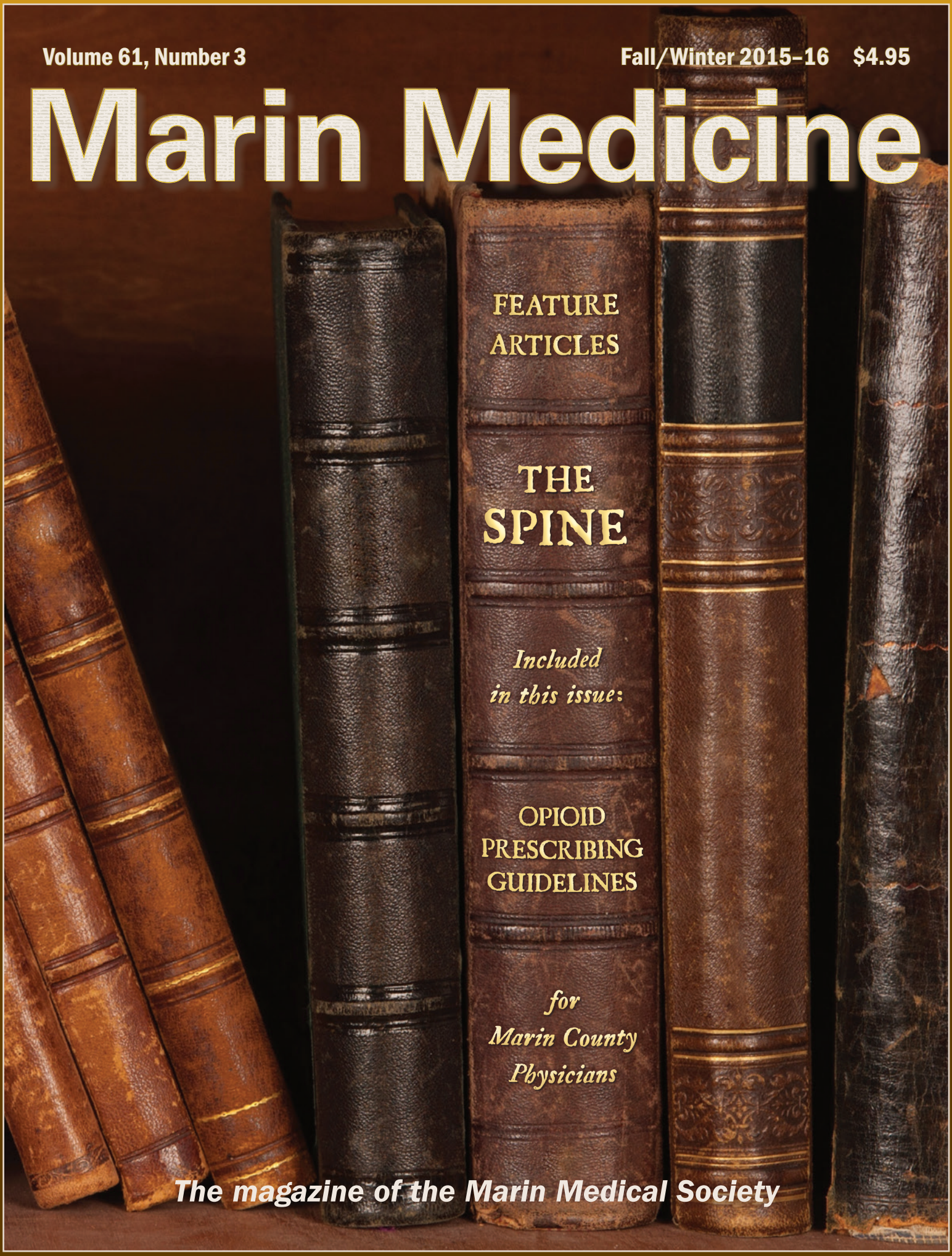
# Marin Medicine



FEATURE ARTICLES

## THE SPINE

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Volume 61, Number 3 Fall/Winter 2015–2016

# Marin Medicine

*The magazine of the Marin Medical Society*

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# Marin Medicine

*The magazine of the Marin Medical Society*

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EDITORIAL

# Spinal Motion Restriction Needs to Be Restricted

Dustin Ballard, MD

"The best lightning rod for your protection," Ralph Waldo Emerson once said "is your own spine." In medicine however, knowing when and where a patient's spine can protect itself has proven extremely challenging. Take, for example, pre-hospital protocols for spinal immobilization of trauma patients.

For nearly 50 years, the training and culture of our pre-hospital providers has resulted in millions of people being unnecessarily strapped and taped to hard plastic boards. This practice of spinal motion restriction (SMR) remains standard in many localities. And, while in cases of severe spinal trauma such restriction *might* prevent injury progression, in other situations the use of backboards can be painful and even harmful.

Let's imagine your run-of-the-mill fender bender. Police and paramedics have been called and the driver has escaped his vehicle and walked away in dismay. When asked by the paramedics, he admits that his neck is a tad sore from whiplash.

Next thing this guy knows, he is pinned to a hard board with a stiff collar around his neck. His head is taped down and there are straps restraining his chest. He has received the full-on SMR treatment, and he will not be freed until sometime after he arrives at the ED.

*Dr. Ballard is an emergency physician at Kaiser San Rafael and Medical Director for Marin County Emergency Medical Services.*

In this instance, the paramedics have done exactly what they were trained to do. But have they done this patient any good? Almost certainly not; and it's time we all recognize that there is virtually no evidence to justify SMR.

Full-on SMR began in the late 1960s as the field of EMS was just emerging. At the time, a handful of case-report-level publications recommended its use, and it quickly became standard treatment. Today, some five million patients are bound to backboards in the U.S. each year. Of these, only about 1% actually have any sort of serious spinal injury, and only a miniscule percentage of these might actually benefit from being lashed to a backboard. According to a 2010 study by Haut, et al,[1] analyzing data from the National Trauma Data Bank, the estimate of such an "unstable but incomplete" injury is on the order of 1 in 10,000 patients. Let me repeat that: Only 1 in 10,000 patients with a traumatic event might have an incomplete, unstable spinal injury in the field. So, at best, the full-on SMR has a number needed to treat (NNT) of about 10,000. And that assumes that it can help prevent progression of injury—an assumption that has never been proven.

On the other hand, evidence is accumulating against the use of backboards. We've always known they cause pain and anxiety. A significant proportion of healthy patients put on a backboard for an hour will complain of pain when on the board, and some will still have pain after 24 hours. Supine positioning with a backboard can make airway assessment and management difficult, mask neck and upper chest injuries, diminish respiratory function and decrease cerebral perfusion pressure in head-injury patients. Patients may aspirate or, in a struggle to escape, harm themselves or others. The full-on SMR treatment hurts ED throughput too—clogging the works with EMS wall time, staff time, disruption (from clearing patients and disposing of boards), unnecessary x-rays and longer stays. Rather than help, full-on SMR causes pain all around.

Does this sound as silly as a stretcher being called out for a soccer player who takes a flop, dives and rolls after only minimal contact? I think so, especially considering the damage that a backboard can cause a person. (Picture your elderly mother tightly strapped to a hard surface for 30 minutes.)

This is why many EMS jurisdictions are changing the way they use backboards for injured patients. Their revised protocols narrow the criteria for using full SMR to situations where they might truly benefit the patient—such as when there is evidence of a neurologic deficit. Everyone else who fails the State of Maine (the EMS equivalent of the NEXUS criteria) can receive a modified approach—such as a hard or soft cervical collar. The implementation of this type of protocol in Alameda County, California, in mid-2012 resulted in a 58% one-year reduction of backboard use without *any* adverse effects reported.[2] Other EMS jurisdictions, including

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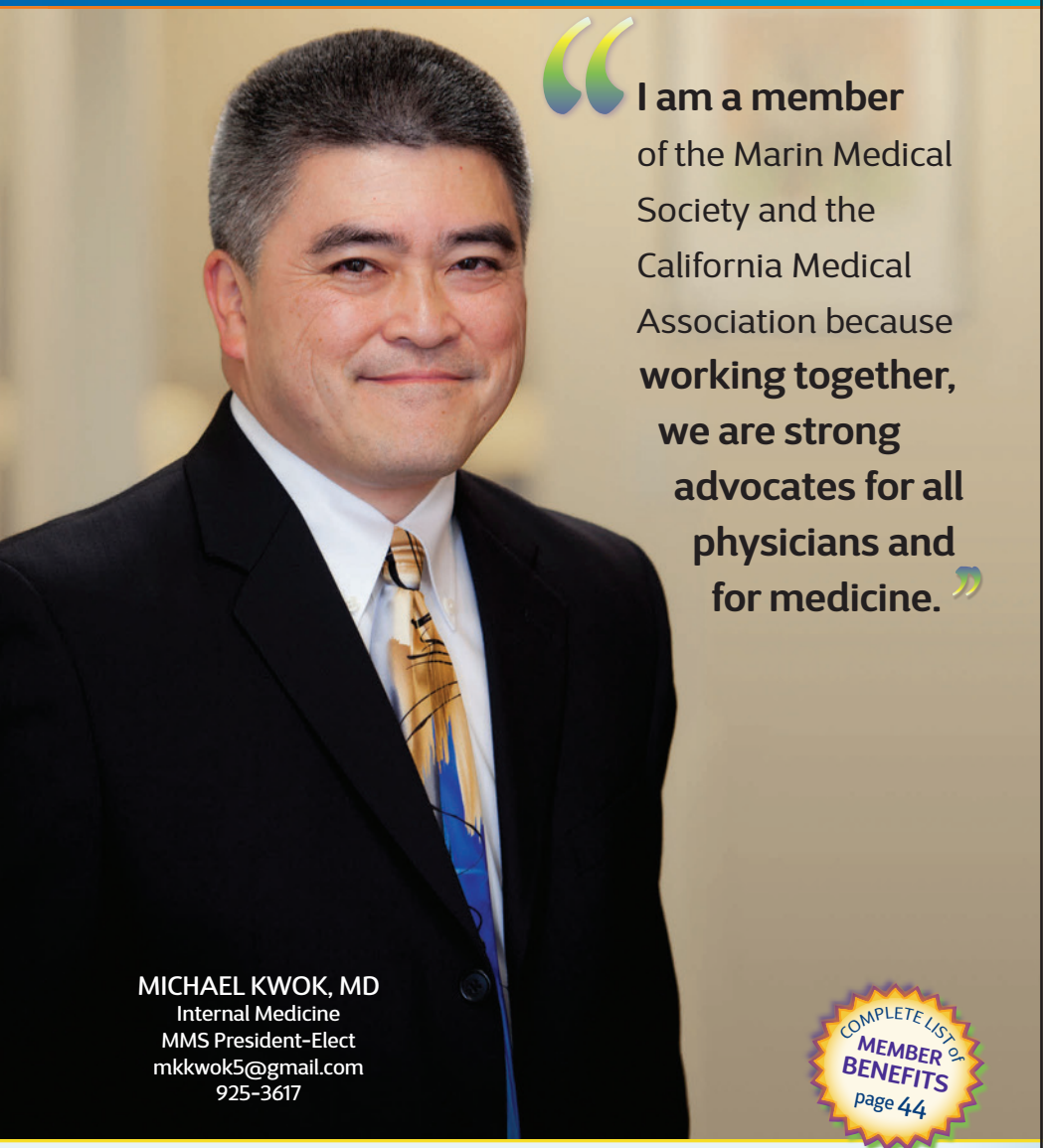
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Marin County, are following suit. In my ED, we are already seeing many more patients arriving with increasingly reasonable (and comfortable) "modified" approaches to SMR. So, when it comes to pre-hospital spine care, less may be more: fewer adverse effects, more comfort.

Elsewhere in medicine, spine care is also evolving. In this issue, *Marin Medicine* explores some of these new developments. Like a "trick back" itself, knowing when to choose surgery for chronic back pain can be unpredictable. So we begin with a *tour d'horizon* of back pain and its causes, treatments and outcomes by Drs. Brian Su and Robert Byers. Minimally invasive procedures are gaining ground in many areas. Dr. Rishi Wadhwa tells us about minimally invasive spinal surgery. Vertebroplasty is a promising therapy for patients with painful compression fractures. Dr. Naveen Kumar gives us a back-to-the-basics on this procedure. Finally, the spine is a common cause of chronic pain, and not all reports of pain have the same level of physiological validity. Drs. Anish Shah and Alex Kettner discuss the spine-rattling frustration associated with detecting and managing malingering patients.

In addition to our regular public health and hospital updates—one of which, the Public Health Update, is devoted to the Marin County Opioid Prescribing Guidelines and is placed right in the middle of the magazine to facilitate its being removed and kept for reference—this issue includes a review of the late Oliver Sacks' autobiography and two out-of-the-office features: a look at the art of M.C. Escher and a physician's view of Burning Man. Worthwhile reading, all of it. Enjoy! ◇

*Email: dballard30@gmail.com*

## References


1. Haut ER, et al, "Spine immobilization in penetrating trauma: more harm than good?" *J Trauma*, 68:115-121 (2010).
2. Morrissey JF, et al, "Spinal motion restriction: an educational and implementation program to redefine prehospital spinal assessment and care," *Prehospital Emergency Care*, 18 (3):429-32 (2014).

# I'm Adrian, and this is my healing place.

**Last year, Adrian Hyman found himself too sick to continue working as a professional photographer.** His worsening fatigue, tingling, balance issues, and muscle weakness made it hard to even pick up his camera. Adrian was diagnosed with Klippel-Feil syndrome, a condition in which some of the neck vertebrae are fused into one bony block. His progressive abnormal alignment and neck bone instability were compressing his spinal cord, and he risked paralysis. Adrian's remarkable surgery was planned and performed by Marin General Hospital's exceptional spine surgery team. Approaching the spine from both front and back, two spine surgeons worked on him simultaneously to ease the pressure on his spinal cord and correct his neck deformity using titanium rods, screws, and plates. Just 9 months later, Adrian's balance issues are gone, his range of motion barely impacted. Camera in hand and clicking away, he's the picture of health.

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# When Is It Needed?

Brian W. Su, MD, and Robert H. Byers, MD

More U.S. health care dollars are spent treating back and neck pain than on almost any other medical condition. In 2005 alone, $86 billion was spent on the treatment of spinal diseases.[1] Low back pain is one of the most common reasons for doctor visits, with one in four adults in a recent survey[1] reporting low back pain within the previous three months. Neck pain is yet another common reason for these visits.

Effective management of spinal disorders can involve therapies ranging from conservative care to complex surgery. Conservative treatments include medication, physical therapy, acupuncture and chiropractic care. The next level of treatment is often injection therapy. Regardless of a patient's spinal symptoms, the vast majority of patients can—and should—be treated with non-operative modalities.

Should all these treatments prove ineffective, however, surgery is sometimes an option. Surgical treatments can range from minimally invasive to extensive reconstruction of the spine. When indicated, surgery can have outstanding outcomes. Unfortunately, many patients are not good surgical candidates and are actually better served through ongoing pain management. Although we are surgeons, it is not uncommon for us to spend a significant amount of time talking patients out of spinal surgery.

*Dr. Su, a fellowship-trained spine surgeon at Mt. Tam Orthopedics and Spine Center, is Director of Spinal Surgery at Marin General Hospital.*
*Dr. Byers is a fellowship-trained spine surgeon at Mt. Tam Orthopedics and Spine Center with 20-plus years of experience.*

For better or worse, the field of spinal surgery today is flooded with new technologies and experimental devices and techniques. Still, the best available evidence of treatment effectiveness is not through the advertisements or websites of these new technology providers, but rather through evidence-based medicine (EBM). The practice of EBM relies on the knowledgeable interpretation of results from clinical trials as reported in reputable peer-reviewed spine journals. One of our primary roles is to educate patients by presenting the results of these trials in a way that patients can understand.

As a practice, we see thousands of patients and perform hundreds of spinal procedures each year. Based on this experience, what follows are our answers to the questions we are most often asked regarding care of the spine.

### What can I do for initial onset back/neck pain before seeing a doctor?

Treat pain with rest, heat and/or ice, and anti-inflammatory medication. Over-the-counter medications include ibuprofen (Motrin, Advil), naproxen (Naprosyn, Aleve) and aspirin; acetaminophen (Tylenol) is less effective as it is not a true anti-inflammatory.

Regardless of which anti-inflammatory is used, it is important to build and maintain a constant baseline level of medication. This is accomplished by taking the medication around the clock every day for the first 14 days in a dosage dictated by either the package or your doctor. In other words, don't make the common mistake of taking the medication only when pain occurs.

For low back pain, a soft lumbar corset/brace may be useful in the first week. Refraining from activities that make the pain worse—such as high intensity exercise—also typically helps during the acute phase of pain.

### What can a primary care doctor do for a patient with spinal pain?

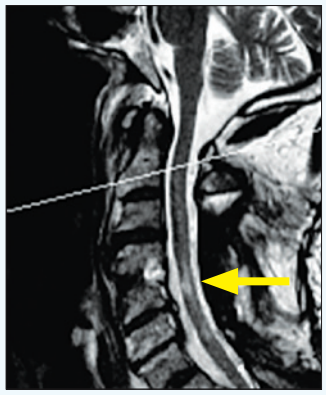
Most pain is categorized as either primarily "axial" (neck or back) or "radicular" (arm or leg). Acute axial spine pain is typically not from nerve or cord compression, but rather from injury to non-nerve tissue. Radicular pain is typically from a pinched nerve. It is important to understand that a pinched nerve in the back can cause buttock pain, just as a pinched nerve in the neck can cause pain behind the shoulder blade. Though pain in these areas is commonly mistaken as axial pain, it more often is caused by early nerve irritation and should be treated as such.

Axial pain treatment includes the use of prescription medications, physical therapy, acupuncture and chiropractic care. Commonly used medications include anti-inflammatories, muscle relaxants and narcotics. High-dose anti-inflammatories should be reserved for patients with no history of peptic ulcers or liver or kidney disease. If pain is associated with muscle spasms, cyclobenzaprine (Flexeril), baclofen (Lioresal) or diazepam (Valium) are often effective. Finally, narcotics can

be used to diminish initially intense pain.

For radicular pain, steroids and/or medications affecting the nerves—such as gabapentin (Neurontin) or pregabalin (Lyrica)—may also be used. However, because these medications can have significant side effects, their benefit needs to be carefully balanced against their risks. Thankfully, their side effects are reversed once usage is stopped.

The use of oral steroids is indicated for severe pain only as they can cause avascular necrosis of the hip, a rare but catastrophic condition.[2] Physical therapy can be helpful once the initial pain is appropriately addressed.

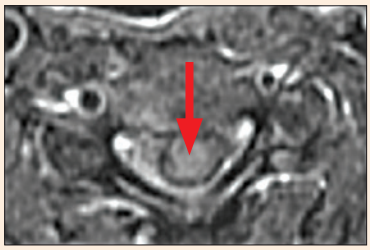


*An MRI of a 43-year-old man with fine motor skill problems and associated numbness of the hands and feet demonstrated spinal cord compression (red arrow). He underwent surgery, and a post-operative MRI is shown with the spinal cord decompressed. The bright spots in the spinal cord (yellow arrow) indicate permanent damage that occurred prior to surgery. His condition was stabilized by the surgery.*

**When should a patient seek the advice of a spine specialist?**

Regardless of treatment, it is well established that 90% of spinal pain goes away within 90 days of onset.[3] However, if a patient has persistent pain after six weeks of medical treatment, referral to a spine specialist is warranted.

Since nerves carry electrical signals to the arms and legs, a pinched nerve can cause not only pain but extremity weakness as well as numbness and tingling. Extremity weakness can range from barely noticeable to complete paralysis. For example, a pinched nerve at L5—the lowest lumbar vertebra—often leads to a foot drop as it can keep the muscle controlling the ankle from receiving adequate electrical signal. Typically, even with non-surgical treatment, as the nerve recovers, strength returns, but numbness and tingling may persist.[4] Nonetheless, when radicular pain is accompanied by significant or progressive weakness, immediate referral to a spine specialist is recommended.



*An MRI (side view and cross section) of a 76-year-old pianist with minimal neck pain but difficulties with fine motor skills, numbness in the legs and weakness in the arms. The MRI showed a large disc herniation (red arrow) with severe compression of the spinal cord. He underwent surgery to relieve spinal cord pressure and had sufficient resolution of his fine motor skill difficulties to be able to resume playing the piano.*

**When should a patient be immediately referred to a spine specialist?**

The spinal cord is essentially a continuation of the brain, sending and receiving signals to and from the entire body. It travels through the neck and thoracic spine and ends at the level of the belly button; from there, multiple nerves branch off, exiting the lumbar spine and sending signals to the bowels, bladder and legs. The multiple nerve branches in the lumbar spine are collectively named the cauda equina due to their resemblance to a horse's tail.

There are two spinal conditions which, if left untreated, could lead to permanent neurological dysfunction: myelopathy and cauda equina syndrome.

*An MRI of the lumbar spine indicating that the spinal cord is a solid structure (red arrow) ending at L1-2. Below the spinal cord are strands of nerves that hang down called the cauda equina. This patient had a disc herniation at the last segment of the spine (yellow arrow) and was at risk for cauda equina syndrome.*

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Myelopathy is the clinical term for spinal cord compression in the neck due to age-related changes, disc herniation or trauma. Interestingly, patients with myelopathy do not always have neck pain. The symptoms of myelopathy are weakness in the arms or legs, hand/foot numbness, difficulty with bladder control, problems with balance while walking, and difficulties with fine manipulative tasks such as buttoning shirts and handling coins.

Cauda equina syndrome is the clinical term for compression of the nerves in the lower lumbar spine typically from a large disc herniation or trauma. It is unusual to see this syndrome with age-related changes of the lumbar spine. Symptoms include pain and weakness in the legs, numbness in the perianal area, and loss of bowel and bladder control.

If a patient has symptoms of either myelopathy or cauda equina syndrome, an MRI should be ordered and the patient immediately referred to a spine specialist. An operation to take the pressure off the spinal cord or the nerves to the bowel and bladder is recommended sooner rather than later to prevent permanent damage.

Cauda equina syndrome is a surgical urgency, with best outcomes achieved when surgery is performed within 24–48 hours of onset.[5]

Unfortunately with these two conditions, despite surgery, most patients achieve stability rather than improvement in their condition.

**What are injection options for treating spinal pain?**

Spinal injections have long been a mainstay of spinal pain treatment. They are typically administered by physiatrists or interventional radiologists. Injections are generally categorized as an injection over either a nerve (epidural) or a structural portion of the spine.

With pinched nerves, epidural injections do not treat the mechanical cause of compression but rather decrease nerve inflammation, allowing the nerve to live in a reduced physical space. When compression is caused by a bone spur that is unlikely to resolve, the goal of the treatment is to enable the nerve to live comfortably in a reduced space once the injection addresses the inflammation. In the case of a soft disc herniation, the goal is for the injection to prevent nerve inflammation as the body heals the disc over time.

Several recent clinical trials have suggested that epidural steroid injections may be no more effective than the injection of local anesthetics.[6] Subsequent criticisms of these studies have led to confusion for both patients and physicians regarding the true efficacy of epidural steroids.[7] In general, epidural steroid injections have a 60% probability of working,[8] providing pain relief lasting anywhere from a few days to several years. Since the risks associated with epidural steroid injections are low, we continue to use them as a first-line treatment for radicular pain that has failed medical management. Epidural injections are also used for diagnostic purposes. If medicine placed over a targeted nerve provides temporary relief, this tells us we will be addressing the proper area with surgery.

In the setting of radiculopathy (spinal nerve root dysfunction), we do not advocate repeated injections, particularly since steroid placed around the nerve has been found to cause loss of bone density.[9] If patients need more than 2 or 3 injections for a structural problem (e.g., a pinched nerve), we encourage them to consider surgery to address the problem permanently.

**How do I know if I am a good candidate for surgery?**

Other than for progressive myelopathy or cauda equina syndrome, every patient should first exhaust all non-operative treatment options and consider surgery only as a last resort. Even patients with pain and extremity weakness from a pinched nerve should be initially treated with conservative (i.e., non-surgical) care, as clinical outcome studies have shown that non-operative care leads to as much strength recovery as surgery. We typically tell patients that they should have surgery only if pain is interfering with their physical and emotional quality of life: physical quality of life meaning their ability to enjoy pleasurable activities (traveling, exercising, spending time with friends,


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etc.), and emotional quality of life meaning their ability to live without feeling depressed by pain.

In general, axial neck and back pain is multi-factorial and can come from a variety of anatomical structures in the spine. It is typically a combination of arthritis, disc disease and soft-tissue inflammation. For this reason, the diagnosis of axial pain is a trial-and-error process that can often be frustrating for patients. This is also why the treatment of axial pain should be non-surgical. While there are exceptions to the rule (such as for fractures or severe curvature of the spine), we generally do not recommend surgery for patients who have back pain alone, as it provides marginal benefit when compared to non-operative care.[10] In fact, when 100 spine surgeons were asked if they would have spine surgery for axial low back pain alone, only 2 responded "Yes."[11] On the other hand, patients with axial neck pain tend to be better candidates for surgery with an 80% chance of success.[12,13] Patients need to speak with a spine surgeon to carefully weigh the benefits and risks of surgery for axial neck or back pain.

Patients with back pain accompanied by buttock/leg pain or neck pain accompanied by shoulder blade/arm pain are good candidates for surgery because such pain can be traced to a specific problem: a pinched nerve. This, in turn, can be caused by specific conditions, including a bone spur, cyst, disc herniation, fracture or abnormal bone shifting ("instability"). With such an identifiable cause, surgical treatment has a greater chance of relieving extremity pain than non-operative care.[14,15]

In our practice, we spend a significant amount of time setting patient expectations for surgery, making certain that they understand that almost everyone who has spine surgery continues to live with some degree of residual pain. This is due both to chronic nerve damage that occurred prior to surgery and to other pain factors not addressed by the surgery. Spine surgery is often not meant to make patients 100% pain-free, but rather to make them feel markedly better than before.

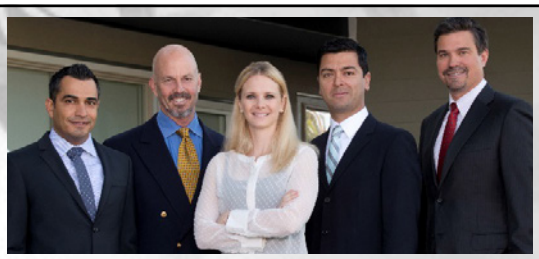
**I have never heard of anyone having a good result from spine surgery. How do I know what my chances of improving really are?**

A key feature of our practice is the maintenance of a spine outcomes registry, a tracking of all of our surgical outcomes made possible by using standardized questionnaires. These outcomes are specific to neck or back surgery and are typically collected for clinical research on the effectiveness of spinal surgery.[16] As an example, if the number 10 represents the most extreme pain a patient has ever felt, our registry tells us that the average patient experiences 7 (out of 10) leg pain before microdiscectomy surgery and 1.5 leg pain one year after. Also in our registry, when patients who previously had surgery for nerve compression are asked if they would have surgery for the same problem again, over 90% respond "Yes."

We encourage all patients to ask surgeons what their surgical outcomes are. We believe it is unacceptable for a surgeon to tell a patient, "All my patients do well and have great outcomes." Even in the best of hands, with perfect surgical indications, this simply cannot be true.

**I heard that I should never have a spinal fusion because it means you have to keep having surgery at other levels. Is this true?**

Typically, surgery to relieve nerve compression is performed minimally invasively, through a small incision. However, there are situations where taking pressure off the nerve is not sufficient to address pain and weakness, and a more extensive surgery—such as a fusion—is required. This is particularly true in the setting of instability or for scoliosis (curvature of the spine) in order to provide mechanical stability to the spine. Furthermore, sometimes taking pressure off a nerve requires the removal of so much bone that it destabilizes the spine, thereby necessitating a fusion. When a fusion is required, multiple techniques are available. Your surgeon should be able to explain why you need a fusion, and only your surgeon can determine what the appropriate technique is for you.

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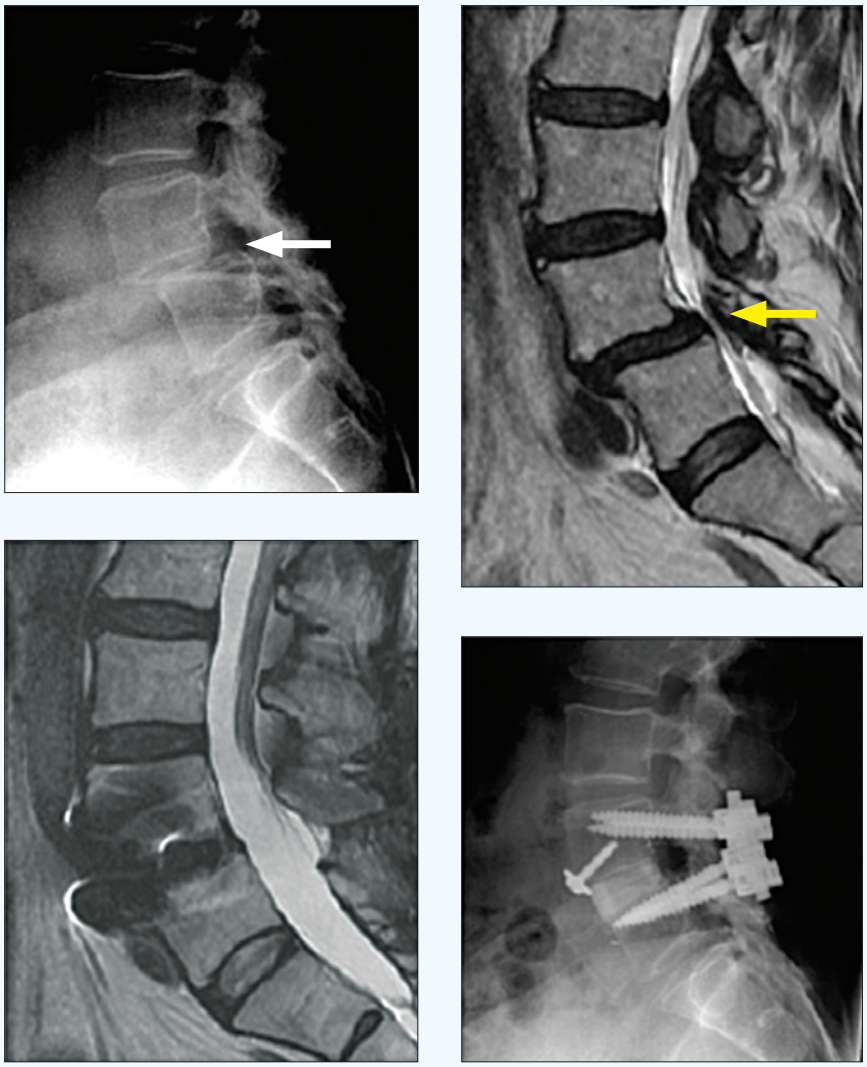

*Images of a patient with abnormal slippage of the bones at L4-5 (white arrow) from age-related changes with associated nerve compression (yellow arrow) and subsequent leg pain. Surgery removed pressure from the nerves and stabilized the segments with rods, screws and bone graft replacing the disc at the unstable level. The patient had a nearly complete resolution of leg pain and a marked improvement in quality of life.*

The spine consists of bones that are sandwiched between discs that act as cushions. While fusing a few segments of the spine typically does not impact a patient's flexibility, it can lead to increased stress on the segments above and below the fusion. This can lead to "adjacent level disease," which occurs at a rate of 3% per year.[17,18] This means that 10 years after surgery, there is a 30% chance that there will be changes (visible on x-ray) at the level adjacent to the fusion. Note, however, that this does not necessarily mean that pain related to these changes will develop. Even though adjacent level disease has been attributed to fusion, disc replacements or other non-fusion techniques have not been shown to definitively decrease its rate of occurrence.[19,20] For this reason, some surgeons feel that adjacent level disease does not result from performing a fusion, but is rather a natural progression of disease.[17] Most likely it is caused by both the increased stress from a fusion and the natural progression of age-related disc degeneration.

A recent large-scale clinical trial looking at the outcomes of lumbar fusion for a pinched nerve from instability in the back indicated outstanding outcomes up to even four years after surgery.[21,22] Overall, requiring subsequent surgery for adjacent level disease is an acceptable risk and is not a reason to avoid a fusion when one is indicated.

### Am I a candidate for laser spine surgery?

Laser spine surgery treats spinal disorders by introducing a laser into the intervertebral disc through a needle or during open surgery in order to shrink the disc. The North American Spine Society, through its evidence-based committee, concluded that laser surgery in the spine cannot be endorsed as a surgical technique because there are no high-quality studies to support its use.[23] The Laser Spine Institute aggressively markets both the use of lasers as well as its ability to perform minimally invasive spine surgery.

While laser spine surgery lacks supporting evidence, minimally invasive spine surgery can lead to very good outcomes in the right patient. For this reason, it has been incorporated into surgical training and almost all spine surgeons are adept at performing these procedures. Only your spine surgeon can determine if you are a candidate for minimally invasive surgery.

### Do I need spine surgery if my imaging studies show areas of degeneration and nerve/cord compression?

Patients often look at their x-ray or MRI report and conclude that surgery may be indicated to treat abnormal findings. As people age, discs and bones naturally undergo degenerative changes that, surprisingly, are often not a source of pain. A landmark MRI study found that over 90% of patients over 60 years old with no back pain had degenerative disc disease and disc protrusions.[24,25] Similarly, patients can have multiple areas of nerve compression that do not necessarily cause symptoms. It is up to your doctor to determine what the cause of your spinal pain is, as surgery is not always indicated for asymptomatic structural abnormalities seen on imaging studies.[26] The adage "We don't treat the image, we treat the patient" holds particularly true for spinal surgery. ◇

*Drs. Su and Byers can be reached at 415-927-5300 or www.mttamorthopedics.com.*

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# Minimally Invasive Spine Surgery

Rishi Wadhwa, MD

Patients often ask if I do spine surgery "minimally invasively." Typically this question is intended to find out if I operate through small openings or with a microscope. This type of surgery—minimally invasive spine (MIS) surgery—is my particular area of interest within neurosurgery. Thanks to this interest, I completed a spine fellowship at UCSF, focusing on developing expertise in performing these procedures and caring for these patients.

MIS surgery employs a set of techniques that allow the surgeon to perform a number of spinal procedures through minimal-access openings, often using small retractor tubes and a microscope. It limits blood loss, obviates the need for muscle retraction (the major cause of post-operative pain in spinal surgery) and leaves a favorable cosmetic result. Almost all degenerative spinal pathologies can be treated this way including:

- Lumbar/thoracic discectomy and foraminotomy
- Lumbar interbody fusions and pedicle screw placement
- Cervical foramintomy and discectomy
- Lateral interbody fusion
- Spinal cord stimulator placement

*Dr. Wadhwa is a fellowship-trained spine neurosurgeon at Marin General Hospital and the UCSF Spine Center. He is also the Spine Medical Director at Novato Community Hospital.*

MIS surgery offers many other advantages. A recent UCSF study[1] indicates that direct benefits include reduced need for narcotics, lower incidence of post-operative wound infections and earlier return to work. MIS surgery is also associated with a direct cost savings of about $4,000 per patient and reduction of VAS (visual analog scale) pain scores in MIS patients as compared to those who undergo open spinal surgery.[1] Multiple studies have demonstrated significantly less blood loss in MIS surgery, thus obviating the need for transfusion and fewer subsequent transfusion-related complications.[2,3] Finally, hospital stays have been shown to be significantly shorter in MIS surgery patients.[3]

The disadvantages to MIS surgery are few. These include an initially steep learning curve, which often deters surgeons from pursuing training in this technique. There is also a slight possibility of increased intraoperative radiation secondary to x-ray use.

Preoperative evaluation is similar in all spine surgeries. Patients must exhaust conservative therapies including rest, physical therapy and interventional pain management. Most patients respond well to conservative treatment. When they do not, the decision on how to proceed can be made after all options are discussed with the surgeon. The patient must be counseled that, as with any procedure, there are risks. With MIS, these include nerve injury, spinal fluid leak and pseudoarthrosis (non-fusion). Patients do not need to be typed and crossed for blood before surgery, as transfusions are extremely rare.

The surgery proceeds as follows: Patients are usually placed under general anesthesia, as there is significant drilling on delicate neural structures. After localization with x-ray fluoroscopy or intraoperative neuro-navigation, a small wire is introduced into the skin on the spine over which small, serially larger dilator tubes are introduced to a maximum diameter of 14 mm for discectomy procedures and 22 mm for fusion procedures (both under an inch, which equals 25.4 mm). Through this small port, the procedural steps, including neural decompression, bone grafting and pedicle screw placement, are completed. Correction of anatomical misalignments can also be performed with MIS. Surgical drains are rarely placed, which limits the chance of infection. Once the procedure is completed, the tube is removed and the incision closed.

After discectomy procedures, patients are sent home the same day; fusion patients are discharged the following day. Post-operative care and instructions are the same as for open procedures. The wound is typically closed cosmetically with dissolvable sutures, and staples do not need to be removed. Patient-reported outcomes are tracked at regular intervals post-operatively. These are submitted to the national neurosurgery quality outcomes database (N2QOD), part of the physician quality reporting system (PQRS).

As this field grows, I have been honored to publish a number of manuscripts and textbook chapters in which I have recommended pushing the envelope with MIS surgery for trauma, deformity and tumor surgery. Though these indications are still in their infancy, the well-accepted indications for degenerative procedures have proven safe and effective. In addition, long-term MIS fusion rates have proven at least equal to those of open fusion procedures.

For most patients, MIS surgery is a viable alternative to open surgery. The surgeon should be adept in both techniques and able to apply the one that best suits the individual patient. This is an exciting time, as Marin County now has the technology and the expertise to apply minimally invasive techniques to spinal surgery. ◇

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## Minimally Invasive Spine Surgery: A Case Example

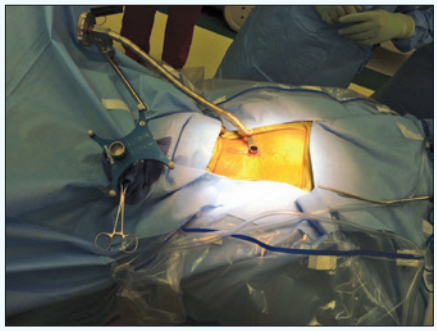

*Image 1a*

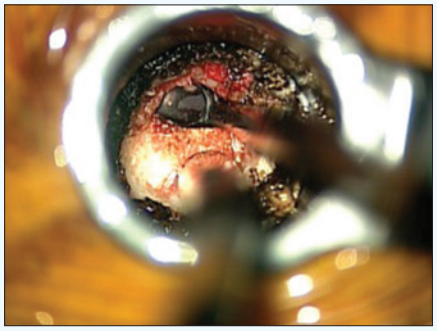

*Image 1b*

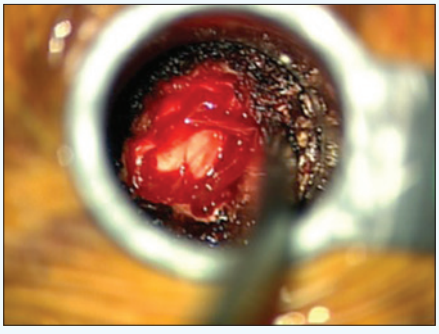

*Image 1c*

For purposes of illustration, I have included a case example:

A 25-year-old body builder presents with arm pain, tricep and pectoralis weakness along with atrophy. He has failed conservative therapies. He takes part in competitions and wishes to avoid having a large scar. His MRI shows a foraminal disc protrusion with foraminal stenosis and nerve root compression.

He underwent a minimally invasive posterior cervical discectomy and foraminotomy through a 14-mm port using neuro-navigation. He went home the same day and at 6 weeks post surgery, regaining strength, he was able to start training for competitions again.

Image 1a shows a 14 mm tubular retractor placed over the back of a patient's neck in an effort to decompress the C6-7 interspace. Image 1b shows a view through the operating microscope after the lamina has been drilled and a curette used to elevate the ligmentum flavum. Image 1c shows a decompressed C7 nerve root after the disc has been removed.


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# Percutaneous Vertebral Augmentation

Naveen Kumar, MD

At first blush, the term vertebral augmentation sounds suspect. Nonetheless, the procedure has the potential to greatly improve the lives of those afflicted with spinal compression fractures. Vertebral augmentation is a catch-all phrase that encompasses two procedures: vertebroplasty and kyphoplasty.

*Vertebroplasty* involves injecting bone cement (polymethylmethacrylate—PMMA) into a fractured vertebral body under fluoroscopic guidance to provide internal fixation and pain relief from a compression fracture. *Kyphoplasty* is basically the same procedure except that it involves initial inflation of a balloon within the vertebra to create a cavity for cement deposition. The two different names for variations of the same procedure are confusing, and in reality kyphoplasty should be considered balloon-assisted vertebroplasty. These procedures are performed by several specialties including radiologists, surgeons and pain specialists. In my practice it is typically done under moderate sedation and does not require a hospital stay. Complications are extremely rare and generally involve cement leakage into areas that can compress nerves or the spinal cord. However, most cement leakage is asymptomatic. On rare occasions, cement has been reported to enter the venous system and can even lead to PE. However, meticulous technique and careful fluoroscopy during injection can prevent this.

*Dr. Kumar is a diagnostic, vascular and interventional radiologist at Kaiser San Rafael.*

The vertebroplasty procedure was developed in France in 1984 and began to gain popularity in the U.S. in the 1990s. However, it became the subject of controversy following the August 2009 publication of negative articles in the *NEJM*[1,2] claiming that vertebroplasty provided no more pain relief than a sham procedure. The sham procedure was identical to vertebroplasty with the important exception that instead of injecting cement into the vertebral body, lidocaine and bupivacaine were infiltrated along the periosteum of the involved pedicle. Both study groups showed equivalent decrease in pain following the procedures and up to 2–3 months later.

Careful review of both articles reveals several flaws in the study, which were addressed in letters to the editor.[3] One flaw was the large number of patients who refused participation in the study. Another was a high crossover rate from the placebo group to the treatment group.

Poor patient selection was an additional and highly critical flaw. The key to any successful procedure is patient selection. In one of the studies the mean age of the fractures was 4–5 months. Treating an already healed fracture is unlikely to provide benefit.

In recent fractures, bony edema is evident on MRI. While there are numerous causes for back pain including disc disease and facet arthropathy, the target for vertebral augmentation is the relief of painful bony edema and inflammation related to the fracture. In our practice we generally require a spine MRI with STIR (fluid-sensitive) imaging to determine if a patient is a candidate for vertebral augmentation. A patient may have multiple compression fractures of different ages, and MRI can tell us which are new enough to be more likely to respond favorably to vertebroplasty. (Figure 1 on page 20 shows two compression fractures. T9 [long arrow] is acute and shows edema. L1 [short arrow] is an older fracture and does not show edema.)

Neither *NEJM* article used MRI findings for inclusion in or exclusion from the study. Most fractures treated were not acute. In addition, the study included patients with mild pain even though it is patients with moderate to severe pain who are most likely to benefit from the procedure. Two larger studies published in *Lancet* in 2009 (randomized trial with 300 patients) and 2010 (randomized trial with 431 patients) *did* show benefit from vertebral augmentation. These trials required fractures to be acute with edema on MRI and moderate to severe pain.[4,5] Figures 2 and 3 show a vertebroplasty success in a recent fracture. Figure 2, a fluoroscopic spot image, shows the patient from Figure 1 with the T9 compression fracture before vertebroplasty. Figure 3 shows same spot after T9 vertebroplasty with good cement fill. The patient had an excellent response with good pain relief.

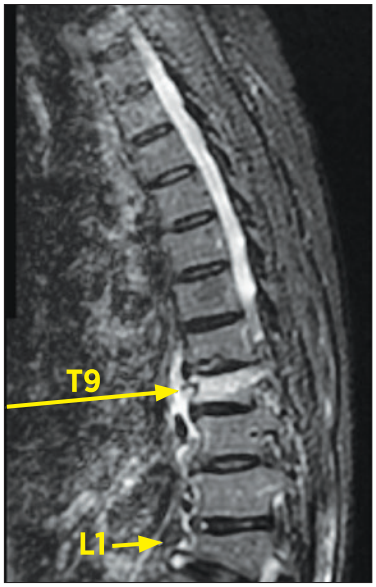


*Figure 1. A recent and an older compression fracture in the same patient. T9 is recent and shows edema; L1 is older and does not show edema.*

*Figure 2. The recent T9 compression fracture in the same patient before vertebroplasty.*

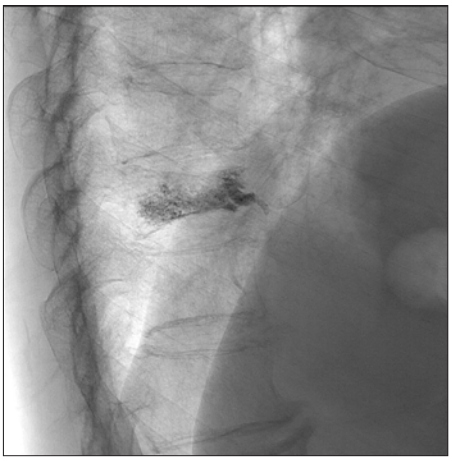

*Figure 3. The same fracture after T9 vertebroplasty with good cement fill.*

In this day and age, personal experience no longer seems to count for much, particularly when compared to clinical trials. However my nearly 10 years of performing the procedure ought to lend a certain degree of credibility to my views and experience. In Marin County we have many elderly patients with osteoporosis who are susceptible to vertebral compression fractures. These fractures can occur spontaneously—just from bending over to pick something up, for example. Many of the patients I see are older women who live alone and have previously been able to care for themselves independently. Their fractures can be very painful and often trigger a visit to the ED, following which they are sometimes admitted for pain control. They become immobilized by pain, and opiates result in sedation and/or delirium. The fracture can wind up setting off a downward spiral. While many will improve slowly over months, there is a risk of permanent pain and disability, not to mention the deformity and kyphosis that arise from multiple fractures.

In my experience, patients with acute fractures in severe pain are ideal candidates for the procedure. I have seen bed-bound, delirious patients who suffer severe pain with any movement transformed in a single day. I recall being on rounds the day after a vertebroplasty. I went to the patient's room and could not find her. To my surprise, I spotted her down the hall, smiling and already able to participate in physical therapy. She was even wearing lipstick. Vertebroplasty can get people out of the hospital and back home sooner.

Osteoporosis can lead to multiple spinal compression fractures, and we have several patients who come back when they suffer a new fracture. Some critics feel that strengthening one vertebral body may lead to fractures of adjacent weak vertebrae. There is no data to support this because we know that patients with osteoporosis continue to fracture multiple vertebrae with or without vertebroplasty having been performed. The fact that patients come back for repeat vertebroplasty speaks volumes about the benefits they derive.

To end this article, allow me to turn to the end (except for the coccyx) of the spine, the sacrum. This bone too is susceptible to osteoporotic fractures. We call them sacral insufficiency fractures. Being at the base of the spine, the sacrum can literally buckle under the weight above. I have done a number of "sacroplasty" procedures that are really nothing more than vertebroplasty of the sacrum. The anatomy of the sacrum, however, is very different from other vertebrae. Its unique flat, broad shape requires placement of the needles under direct CT rather than fluoroscopic guidance to ensure that the cement fills the sacrum appropriately. It is with great satisfaction that I watch the cement fill the porous bone, strengthening it and providing internal fixation of the fracture lines. Comic book fans will understand how this reminds me of the way the character Wolverine had his bones strengthened by the injection of a fictional metal alloy called Adamantium. Unfortunately we do not have such a liquid metal. However, PMMA, which is chemically identical to Plexiglass, works pretty well. ◇

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## PUBLIC HEALTH UPDATE: OPIOID PRESCRIBING GUIDELINES

Matt Willis, MD, MPH

*Marin County has a higher burden of accidental drug overdoses than most California counties. Addressing the problem of prescription drug misuse and abuse is a public health priority, and the Marin Medical Society has partnered with the Department of Health and Human Services to adopt guidelines for the use of opioids in the treatment of chronic non-cancer pain (CNCP). These will be distributed to Marin County prescribers, and I encourage you to keep them available for reference as you navigate choices with your patients. Don't hesitate to tear them out—they've been placed in the middle of the magazine with that in mind. They can also be found at* ***www.RxSafeMarin.org.*** *Thank you.*

*Dr. Willis is Marin County's public health officer. Email: mwillis@marincounty.org.*

# OPIOID PRESCRIBING FOR CHRONIC PAIN

# Guidelines for Marin County Clinicians

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Although prescription pain medications are intended to improve the lives of people with pain, their increased use and misuse have led to a rise in narcotic addiction and overdoses in Marin County and across the country. These guidelines are designed to help clinicians improve patient outcomes and limit the risk of unintended harm when considering the use of opioids for the treatment of chronic non-cancer pain (CNCP).

These guidelines do not address the use of opioids for acute pain, nor do they address the use of opioids for the treatment of pain at the end of life. These guidelines are intended to supplement and not replace individual prescriber's clinical judgment.

For prescribers considering opioids for the treatment of chronic non-cancer pain, these guidelines suggest key practices in the following areas:

- **ASSESSMENT AND MONITORING**
- **PATIENT AND FAMILY INFORMATION**
- **PATIENT/PROVIDER AGREEMENTS**
- **CHRONIC NON-CANCER PAIN TREATMENT RECOMMENDATIONS**
- **NON-NARCOTIC ALTERNATIVES**
- **CAUTIONS REGARDING CO-MORBIDITIES OR INTERACTIONS**
- **RELATIONSHIP WITH PHARMACIES AND EMERGENCY DEPARTMENTS**
- **SAFE STORAGE AND DISPOSAL**
- **ADDICTION AND DEPENDENCE REFERRALS**

These guidelines were developed in collaboration between Marin County Department of Health and Human Services, the RxSafe Marin Prescribers and Pharmacists Committee, and the Marin Medical Society.

RxSAFE MARIN — MARIN COUNTY PRESCRIPTION DRUG MISUSE AND ABUSE INITIATIVE

MARIN HEALTH & HUMAN SERVICES — Health, Well-being & Safety

COUNTY OF MARIN

MMS — MARIN MEDICAL SOCIETY

# OPIOID PRESCRIBING GUIDELINES

## A. ASSESSMENT AND MONITORING

- Before considering chronic opioid therapy, clinicians should gain a clear understanding of the pain condition and document a history, including current medications, prior pain treatment and results, along with a relevant and specific physical examination.
- The initial evaluation should also include documentation of the patient's mental health and substance use history, including review of the CURES system.
- The history should include a functional description of limitations on the patient's activities due to pain.
- Clinicians should consider using a validated screening tool to determine the patient's risk for harmful drug-related behavior.
- Appropriate screening and testing should be completed before, and not after, starting a trial of opioids.
- Clinicians should reassess patients on chronic opioid therapy periodically and as warranted by changing circumstances. Monitoring should include documentation of response to therapy, adverse events and adherence to prescribed therapies.
- Clinicians should consider increasing the frequency of ongoing monitoring as well as referral for specialty care, including psychiatric and addiction experts for patients at high risk for harmful drug-related behavior. Monitoring may include periodic review of CURES database, urine or saliva drug screening, or pill counts.
- Treatment with more than one opioid or concurrent treatment with benzodiazepines, antihistamines and other sedating medications substantially increase risk and should be approached with caution.
- Opioids should not be used as a sole treatment modality for pain. Rather, opioids should be considered as a treatment option after failure of other modes of treatment and as part of a multimodal approach including exercise and behavioral therapy.
- Providers should recognize that high-risk patients, including those with significant psychiatric co-morbidities, may require specialty care. Treatment of some co-morbid conditions may be less effective when opioids are used. Chronic opioid therapy may not be safe or effective absent needed specialty care.
- Opioids should be discontinued if an initial trial of chronic opioid treatment results in adverse effects, insufficient reduction in pain or insufficient improvement in function.

## B. PATIENT AND FAMILY INFORMATION

- Patients and, where appropriate, their families should be given information about and discuss the risks, adverse effects and possible benefits of chronic opioid use before initiation of a trial of chronic opioids.
- Patients being offered opioids should be made aware that opioids are the leading cause of drug overdose deaths nationally, can cause adverse outcomes to patients or to others who may misappropriate the medication, and can cause harm if not managed safely.
- The clinician should advise the patient and significant others of the risk of cognitive impairment that can adversely affect the patient's ability to drive, work in a safety-sensitive position, or safely do other activities.

## C. PATIENT/PROVIDER AGREEMENTS

- When starting a trial of chronic opioid therapy, providers and their patients should document a common understanding of the process through the use of an opioid treatment agreement.
- The provider and patient should participate in shared decision-making, informed by the potential benefits and risks associated with treatment.
- The patient should understand how care will be provided, including agreement to obtain prescriptions from one provider or his or her designee during weekday business hours, use of one pharmacy for medication, proper and secure storage, and the proper return of unused medications.

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- If chronic opioid treatment results in significant adverse effects, or insufficient reduction in pain or functional status, opioids therapy should be discontinued.
- Providers should proactively describe the rationale for regular office visits, examinations, urine or saliva drug testing, CURES report monitoring, and pill counts.

## D. CHRONIC NON-CANCER PAIN TREATMENT RECOMMENDATIONS

- Initial treatment with opioids should be considered by clinicians and patients as a therapeutic trial to determine whether opioid therapy is safe and effective for the individual patient. Chronic opioid therapy will not be effective for some patients, either due to lack of efficacy or the development of unacceptable adverse events, including aberrant drug-related behavior.
- Opioid selection, initial dosing, and dose adjustments should be individualized according to the patient's health status, previous exposure to opioids, response to treatment, and predicted or observed adverse events.
- When considering dose escalation, clinicians should consider that dose escalation can be a sign of hyperalgesia, which renders opioids less effective.
- Total daily opioid doses above 100 mg/day of oral morphine or its equivalent are associated with a significant increase in risk of harm and in many cases worsening pain. Clinicians should carefully consider if doses above 100 mg/day of oral morphine or its equivalent are indicated. Consultation for specialty care may be appropriate for patients receiving high daily doses of opioids. (Online tools are available to assist in converting daily opioid doses to morphine equivalents **http://www.nyc.gov/html/doh/html/mental/MME.html.**)
- Prescribers should be aware that buprenorphine therapy can be a safe and effective method for tapering patients from high doses of opioids as well as a lower-risk, long-term therapy for those patients too medically or psychiatrically fragile to taper off opioids completely.

## E. NON-NARCOTIC ALTERNATIVES

- Exercise is frequently effective for the management of CNCP.
- Non-steroidal anti-inflammatory drugs (NSAIDS) and acetaminophen have demonstrated effectiveness in the reduction of CNCP.
- Cognitive behavioral therapy, especially addressing management of emotional distress, can help control pain non-pharmacologically.
- Anti-epileptic medications have some evidence of effectiveness for neuropathic pain such as diabetic neuropathy and post-herpetic neuralgia.

## F. CAUTIONS REGARDING CO-MORBIDITIES OR INTERACTIONS

- Caution should be used in patients taking other centrally acting sedatives, including alcohol, antihistamines and benzodiazepines, as such use with chronic opioid therapy increases the risk of over-sedation and adverse events.
- Caution should be used with the administration of methadone. Providers should be aware of the special pharmacokinetics of methadone and the need for careful dosing and monitoring.
- Caution should be used with the administration of chronic opioids in women of childbearing age, as opioid therapy during pregnancy increases risk of harm to the newborn. Opioids should be administered with caution in breastfeeding women as some opioids may be transferred to the baby in breast milk.
- When chronic opioid therapy is used for an elderly patient, clinicians should consider starting at a lower dose, using a longer dosing interval, and monitoring more frequently.

*(continued on next page)*

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- Caution should be used in patients under age 40 due to increased lifetime exposure with long-term opioid therapy and the risks of central nervous system damage, and the higher rates of misuse among this age group.
- Patients with obstructive sleep apnea (OSA) are at increased risk for harm with the use of chronic opioid therapy.
- Caution should be used for patients over age 65 due to declining renal and hepatic function, leading to reduced metabolism and excretion, balance and gait problems, fall risk, declining bone density and muscle mass, and cognitive decline.
- Patients with coexisting psychiatric disorder(s) may be at increased risk of harm related to chronic opioid therapy. If chronic opioids are used, clinicians should consider careful dose selection, frequent monitoring and consultation where feasible.
- Clinicians should consider prescribing naloxone to the patient and provide instructions in how and when to administer naloxone for family members or friends of patients identified to be at high risk for overdose or aberrant drug-related behavior.

## G. RELATIONSHIP WITH PHARMACIES AND EMERGENCY DEPARTMENTS

- Pharmacists who dispense medications have corresponding responsibility to ensure the prescription is legal and not for purposes of abuse. Pharmacists may employ screening guidelines to trigger communications with clinicians to verify prescription orders.
- It is appropriate for pharmacists to have educational conversations with patients on potential side effects of opioids, drug-drug interactions, and adverse effects. With patients receiving over 100 mg /day, pharmacists should feel enabled to initiate discussions with clinician and patient about naloxone.
- Pharmacists should educate patients regarding safe storage and disposal of medications.
- Emergency Department providers should consider referring patients seeking opioids for chronic pain to their primary care providers to maintain continuity of treatment.
- Emergency Department prescribing standards have been developed and are in place in all Marin County hospital Emergency Departments. These standards were developed in partnership with Marin County Public Health and Emergency Medical Services.

## H. SAFE STORAGE AND DISPOSAL

- Patients should receive education and information on safe storage and disposal or return of controlled substances. Materials should include information on lockboxes for safe in-home storage of prescriptions.
- Drop boxes for unwanted/unused medications are located throughout Marin County. For a current list of drop-off locations go to **www.marincounty.org/ehs**.

## I. ADDICTION AND DEPENDENCE REFERRALS

In Marin County, the following organizations can provide information for drug treatment services:

**Access to Mental Health & Substance User Services:**
**888.818.1115**

**Assessment & Referral Services:**
Recovery Connections Services: **415.755.2345**

**Detoxification Services:**
The Vine (Residential Detox): **415.492.0818**
Marin Treatment Center (Outpatient Opiate Detox): **415.457.3755**

**Adult Gender-Specific Residential Treatment:**
Center Point: **415.456.6655**

**Adult Outpatient Treatment:**
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MARIN COUNTY PRESCRIPTION DRUG MISUSE AND ABUSE INITIATIVE

# Detection and Assessment of Malingering in Chronic Pain Patients

Anish Shah, MD, and Alex Kettner, PsyD

According to several research studies, malingering, often referred to as symptom fabrication, may occur in a striking 20–40% of patients presenting with chronic pain. Symptom fabrication is defined as a condition where an individual intentionally exaggerates physical or psychological symptoms for external incentives such as obtaining financial compensation or medication, avoiding work or military duty, or eluding criminal prosecution.[1–4]

Although it has been proposed that symptom fabrication typically occurs in the hope of potential financial gain, statistics show that this is not usually the result. Studies have indicated that 82% of disabled people living in the U.S. have greater financial difficulties than when they were working, financial status remained about the same for 17%, and only 1.5% experienced financial gain.[2,5] The reasons proposed for some patients assuming a "sick role" include:[1–3]

*Dr. Shah is a psychiatrist with offices in Santa Rosa, Novato and San Rafael. Dr. Kettner is a clinical psychologist in Petaluma. Both are qualified medical evaluators (QMEs).*

- Weighing the cost/benefit of malingering.
- Not recognizing a better alternative.
- Wanting to avoid work-related stress.
- Dissatisfaction with a current position.
- Trying to obtain medication.
- Trying to receive the medical coverage that often accompanies disability benefits.

Two 1990 nationwide surveys of Americans showed that 20% believed that fabricating symptoms for workers' compensation claims was acceptable.[6,7] Moreover, a 2002 survey involving 144 neuropsychologists across the U.S. and Canada who performed medical-legal evaluations reported that 33.5% of injured patients with chronic pain engaged in symptom fabrication.[1] This suggests that workers' compensation claims can sometimes prompt symptom fabrication, whether for financial incentive or as an unintended result of medical-legal complexities.

Due to the fairly high incidence of symptom fabrication among disability claimants, distinguishing patients who are fabricating or exaggerating symptoms from those who are truly chronic pain sufferers is a significant challenge for clinicians. This may be due to the complex and time-consuming nature of such assessments and/or clinicians' concerns about the potential legal liabilities of a misclassification or the stigmatization it may cause a patient.

Clinicians face additional obstacles because the doctor-patient relationship cannot be upheld in such cases. The assessment is based primarily on self-reported data, and the patient's credibility may be brought into question, which can often lead to an exaggeration of reported symptoms. Obstacles like these raise the question as to how clinicians who serve as qualified medical evaluators (QMEs) in such cases can effectively perform objective evaluations.

For years, self-reports have been the most widely used way of assessing chronic pain.[8] To date, however, a reliable and accurate method of detecting symptom fabrication in self-reports is not available. To address this issue, a novel assessment was recently developed that involved measuring temperature and pain-sensation thresholds in healthy people under two conditions: one that encouraged honest reporting and one that encouraged feigning pain. The results can be used as a standard against which the scores of individuals reporting pain can be compared. It is possible that this approach may help clinicians better detect malingering.[8]

According to the DSM-IV-TR, patients who are suspected of fabricating symptoms typically display the following behavioral and emotional patterns:[4]

- Symptoms presented in a medicolegal manner.
- Marked discrepancies between reported symptoms or disability and clinical findings.
- Failure to cooperate during evaluation or to comply with the prescribed treatment regimen.

- Symptoms associated with antisocial personality disorder.

Combining observed patterns like these with the results of the recently developed assessment approach mentioned above may prove to be an effective means of detecting chronic pain malingering.

Conversely, criteria that clinicians can consider when evaluating patients exhibiting true chronic pain include:

- Information that the patient has received intensive treatment for the injury.
- Objective corroboration of the reported symptoms and the diagnostic evaluation.
- Evidence that the patient has suffered obvious and significant personal and financial losses.
- Presence of self-defeating behavior.

Symptom fabrication must also be differentiated from conditions such as undetected or underestimated physical illnesses, somatoform disorders (e.g., pain, somatization, hypochondriasis, conversion), and factitious disorders that present predominantly physical symptoms.

When a clinician is evaluating a potential symptom fabrication case, the diagnosis is based mainly on whether other factors that may contribute to the patient's condition can be excluded. One critical factor that must be ruled out is an undetected or underestimated physical illness that may be responsible for the symptoms, disability and impairment presented. Similarly, the clinician must exclude somatoform disorders associated with symptoms of a psychological etiology that are not fabricated or exaggerated. Conversion disorder, also classified under the somatoform category, generally results in actual physical symptoms such as voluntary or sensory deficits attributed to psychological and neurological factors.[4] Hypochondriasis, although somewhat psychological in nature, is based on a patient's misrepresentation of one or more actual symptoms,[4] thereby excluding this condition too from symptom fabrication.

In contrast to undetected or underestimated physical illnesses and somatoform disorders, factitious disorders are characterized by physical signs and symptoms that are intentionally exaggerated or, in some cases, fabricated in order to assume or maintain the "sick role."[4] Symptoms may include self-reported pain from a nonexistent or self-inflicted condition and/or the exacerbation of a pre-existing medical condition. However, if external incentives such as financial gain or the avoidance of legal prosecution are absent in patients who present with factitious disorders, it would appear that malingering can be excluded as the cause of these disorders.

Clinicians must also consider how social and cultural factors may influence the presentation of illness-related behavior since research shows that sociocultural factors can affect the way patients display symptoms.[9,10] For instance, pain-related behavior is dramatic in some cultures and stoic in others. So a perceived exacerbation of symptoms should not automatically be deemed a sign of symptom fabrication without applying additional differential diagnostic criteria, e.g., cultural criteria.

In order to circumvent some of the obstacles that clinicians face as QMEs, California and some other states use the Frye standard to help clinicians select the appropriate symptom fabrication assessment methods and tools. Furthermore, a QME's testimony must meet the Frye standard to be admissible as evidence in civil, criminal, disability and workers' compensation cases. Meeting the Frye standard may guide a judge's decision regarding the validity of the expert's testimony.

According to the Frye standard, an expert's testimony should be based on reasoning and a methodology that is generally accepted within the relevant scientific community, using the following criteria:[11,12]

- Is the witness qualified to be an expert?
- Is the underlying scientific premise generally accepted?
- Is the evidence that has been presented based on a testable theory or on a technique that is falsifiable and refutable?
- Has the scientific evidence been sufficiently tested and accepted by the relevant scientific community?
- Has the theory or technique been subjected to peer review?
- Is there a known error rate for the assessment?

Based on these criteria, if a QME uses an assessment that does not have supportive evidence from peer-reviewed studies or methods, a Frye challenge may arise—although the standard of evidence in California is reasonable medical probability. Nonetheless, a challenge limits the type of assessment tools that a QME can choose. This limit may serve as a guide toward the best choice.

Back pain is a common chronic condition that may motivate some sufferers to engage in symptom fabrication or exaggeration. Back pain may arise in the bones, muscles, ligaments, tendons and nerves in different parts of the back. It may be classified as acute pain that lasts six weeks or less; periodic or frequent pain that persists up to three months; or chronic pain that lasts more than three months.

A number of diseases or injuries may result in back pain. Low back pain is the most commonly reported type, resulting in millions of annual emergency room


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visits. According to the American Physical Therapy Association (APTA), more than 60% of Americans have experienced debilitating low back pain at some point in their lives, though middle and upper back pain are also frequently reported.[13]

Clinical comparisons of patients with chronic back pain have shown that those seeking compensation often report significantly higher levels of pain, disability, psychological problems, unemployment and time off work than patients not seeking compensation.[14] The amount of time spent seeing doctors for medical reports and lawyers appears to rise in parallel with apparent symptom fabrication, as does awareness that a longer recovery could result in a larger financial settlement.[15] Therefore, in many cases of chronic back pain, the effects of the back injury, the psychological disturbances, and the quest for financial compensation often elicit symptom fabrication. Through careful observation and examination, QMEs can distinguish true pain patients from those engaging in fabrication.

A complete physical and medical assessment for chronic pain fabrication should adhere to the following guidelines:

- Physical examination relevant to the reported chronic pain.
- Patient self-report.
- Structured interview that focuses on variables indicative of possible symptom fabrication.
- Review of medical records and diagnostic tests.

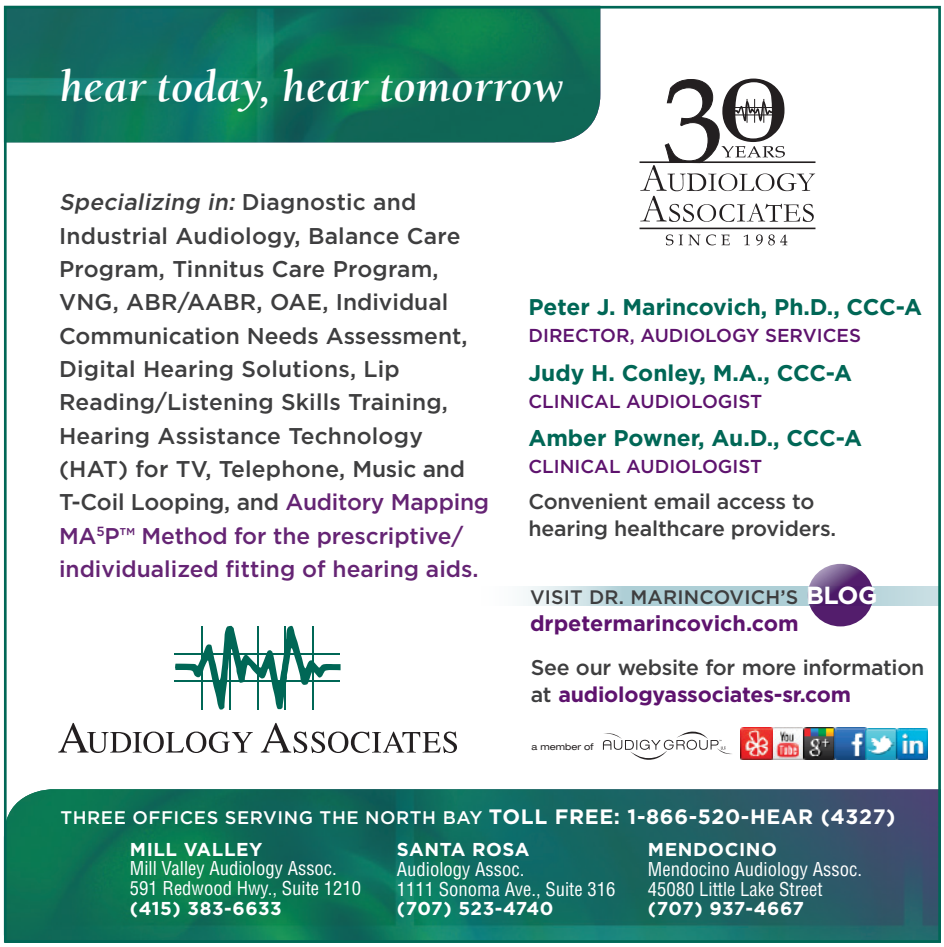
If psychological symptoms need to be evaluated, a psychological QME should screen for them in a comprehensive evaluation. This should include a clinical interview, a mental status examination, behavioral observations, standardized psychological tests and, if possible, third-party information. Obtaining information that contradicts—or supports—the examinee's version of events is probably the most accurate means of detecting exaggeration, fabrication or denial—or their absence—and may be the only viable evidence in the case of examinees who sabotage interview and testing efforts.[16]

The following commonly used psychological tests are helpful in detecting symptom fabrication, symptom exaggeration and testing effort.

- Minnesota Multiphasic Personality Inventory-2 (MMPI-2)—The validity scales (L, F and K) can be used to help identify individuals motivated to exaggerate or fabricate psychological symptomology.
- Rey 15-Item Memory Test (Rey-15)—This is used to detect feigned memory impairment.
- Test of Memory Malingering (TOMM)—This forced-choice measure is used to detect malingered memory impairment.
- Validity Indicator Profile (VIP)—This is used to assess testing effort.
- Victoria Symptom Validity Test (VSVT)—This forced-choice measure is used to detect exaggerated or feigned cognitive impairment.

The Modified Somatic Perception Questionnaire (MSPQ) and Pain Disability Index (PDI) are also useful in helping clinicians identify chronic pain patients whose physical symptoms may be non-organic. Both these assessments have been shown to effectively detect malingering by accurately differentiating between pain-related disability where malingering is present or absent. Furthermore, the MSPQ and PDI can indicate the need for clinical treatment of chronic pain by assessing a potential psychological overlay along with malingering. This alerts clinicians to psychological issues that may hinder effective treatment as well as whether additional psychological testing may be necessary.[17]

Research also indicates that instruments such as the MMPI-2 Restructured Scale 1 (RC1) are effective at detecting malingering in chronic pain patients who are motivated by external incentives (e.g., disability benefits) as well as those who have no external incentive to exaggerate symptoms.[18] Similarly, the Lees-Haley Fake Bad Scale (FBS) and the Henry-Heilbronner Index (HHI), which are often used to identify non-credible symptoms in disability claimants and personal injury litigants, have been shown to be efficient in revealing exaggeration of illness-related behavior.[18]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Tests such as the Portland Digit Recognition Test (PDRT) and the Test of Memory Malingering (TOMM) often fail to detect malingering when administered separately, but demonstrate superior efficiency when used in combination.[19] These findings indicate that it is good practice to combine several tests to help differentiate between malingering and non-malingering chronic pain patients. Previous research supports this practice; it has been suggested that the administration of numerous neuropsychological tests, up to nine in certain cases, has been shown to correctly identify nonlitigating and litigating patients.[20] More specifically, failing any two of these tests indicates that a patient is displaying motivational issues. Administering several tests is thus an optimal means of clearly identifying—or ruling out—malingering.

In summary, health care professionals who have taken on the role of independent medical examiner (IME) or qualified medical evaluator (QME) in symptom fabrication cases should focus the evaluation on searching for the presence or absence of compelling inconsistencies in the self-reported, medical and neuropsychological data obtained from several tests, in conjunction with reviewing potential motivations or circumstances that may explain illness behavior. QMEs and IMEs who are aware of, have access to and are able to administer optimal medical and neuropsychological symptom fabrication evaluations that follow the Frye standard are best prepared to meet this challenge. ◇

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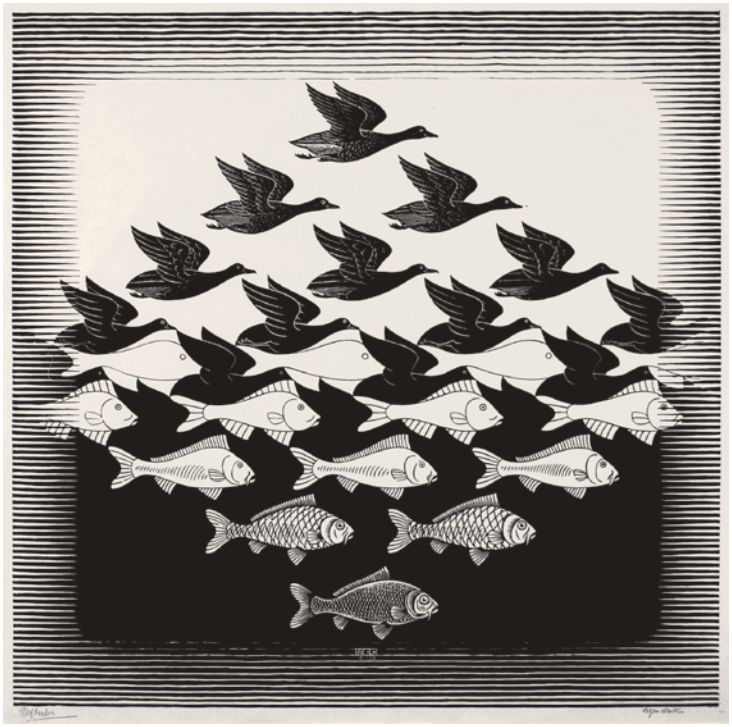
# From Escherphilia to Escherology

Sal Iaquinta, MD



Sky and Water *(1938)*

*Highly technical. A devotion to symmetry. Creative.*

Those phrases sound like requirements for my job—I spend most of my days removing facial skin cancers and reconstructing the defects. But I'm actually talking here about the art of M.C. (Maurits Cornelis) Escher, the 20th-century Dutch printmaker whose idiosyncratic work enjoys wide popularity. Of course, anyone who knows me understands my attraction to Escher's art, but I hope I come off a bit less OCD than he does.

My adventure into the world of Escher started off like most. As a teenager, I was wowed by his impossible buildings and interlocked animals "infinitely filling" a plane. On my 18th birthday my mom took me to an Escher exhibit in Madison, Wisconsin. I left the show with a couple of Escher posters that traveled with me from dorm room to apartment throughout college. It sounds typical: Escher's work is often considered "college art" rather than "high art." Some might argue that it's gimmicky, but isn't that true of a lot of art? Splattering paint on canvas isn't a gimmick? How about painting soup cans?

*Dr. Iaquinta is a San Rafael otolaryngologist.*

Obviously I'm biased. I'll give the critics that Escher's output was prints, not paintings. Many people have no idea what an "original" print is. In Escher's day the question was a lot easier to answer—there were no computers, much less inkjet printers. Nowadays giclée printers reproduce images on canvas or paper with near-original quality.

For Escher, an original was printed from the "block." Escher's blocks were primarily woodcuts and lithographs. A woodcut is created by carving or etching an image into a flat wooden block and then rolling ink onto the block. The inked block is then pressed onto paper, like a giant stamp, creating an image (see explanation on page 32).

Lithographs are a little more complex. An image is drawn on a flat stone surface with an oil-based pencil. Then, using water and oil-based ink, the image can be transferred to paper.

So, an original is whatever comes off the block—wood or stone—onto the paper. Escher had all of his blocks and stones deliberately destroyed upon his death, so the only original prints that exist were made in his lifetime. Moreover, Escher signed most of the larger prints. Some pieces were printed hundreds of times; others just a few.

Regardless of scarcity, I wanted one.

In the early 2000s I decided to try finding an Escher print. I discovered that a gallery in San Francisco had specialized in Escher's artwork for decades but had recently closed. So I did a Google search. A couple of options popped up. I called the first number, and it was the very man who had put on the show I saw in Madison. Now in Santa Cruz, he invited me to see some of his pieces and buy one. I made the trip and saw about a hundred works. A few things struck me that day. First, Escher had created a large body of work before the "gimmicks." Most of the images he created between ages 20 and 40 were Italian landscapes and cityscapes. Although

Castrovalva *(1930) is one of Escher's most famous Italian works, yet you won't see it as a poster in dorm rooms. It shows an almost surreal, sweeping landscape, not far removed from the background of* Belvedere*. The scene is almost dizzying and full of fantasy, but not impossible like his future works. Escher takes a little liberty with perspective, by juxtaposing big and little: a normally* **large** *town appears tiny in the distance in the bottom right and a usually* **small** *beetle and snail appear huge in the lower left corner.*

they're not as famous, these early works highlight Escher's technical skill in much the same way that Dali's oeuvre from the period before he became a surrealist shows genuine talent for realism.

The second thing I realized is that art books don't do justice to Escher's work. Shrinking a large, colorful woodcut down to a few inches and printing it in black and white on a page sandwiched between other works just doesn't work; but that's exactly the case in Escher's *catalogue raisonné*, the comprehensive listing of all his known work. Even the posters don't come close to his original work. Many of Escher's tessellated works (characterized by perfectly interlocked shapes, without overlaps or gaps) have a rigidity to them, especially when viewed in books. In actuality, they are printed on very delicate, handmade papers, which offset the stiff geometry of composition. The ink almost glistens as though still wet after all these decades. When you see it, you know it must not be touched.

I bought *Fishes and Frogs*, a small transformative tessellation that embodies the very essence of Escher. At the top, fish swim in water. The spaces between the fish morph into frogs (which is what makes this tessellation a transformative one) as the fish themselves devolve into the land behind the frogs. This was a much smaller version of the far more famous *Sky and Water* in which birds and fish tessellate. But it was all I needed to find myself enthralled. I wanted to know more and see more. I was hooked.

Books offered a basic history of the man and his art, but I wanted more. The Escher Foundation's website wasn't very robust either. In fact, Escher's biography hasn't even been translated into English. One rumor is that the copyright holder thinks it portrays Escher poorly. Yes, Escher did go through a divorce, and he was probably a bit obsessive-compulsive. These days he might even be perceived as falling somewhere on the Asperger's spectrum. But the excerpts from his journals and letters that I've read portray an introvert with a gentle soul; a clever man who is constantly amazed by the wonders of nature and at the same time boyishly curious as to why her rules can't be broken. Escher tried to break them as subtly as he could. It's one thing to create impossible buildings; it's another to invent a creature that curls into a ball to roll around because "nature doesn't use the wheel."

So, in an effort to find owners and sellers and to collect and disseminate information, I created a website—eschersite.com—and filled it with nearly 600 images and a bucketful of "Escherology." A whole section is devoted to fakes and reprints—the things people think are real because along the way museums and others have made some convincing reproductions. It kills me to see people paying ridiculous sums for posters they think are originals. In the good old days, you could email other eBay bidders. When I told one bidder the *Hand with Reflecting Sphere* was a poster, he replied, "You're just trying to scare me off of bidding."

The site's popularity continues to grow. I've had the opportunity to meet with curators, former gallery owners,

collectors who have met Escher, and even the owner of the Escher estate. I've contributed writings to museum catalogs. And the most fun: finding new homes for Escher artworks that former owners no longer want (or leave behind).

One highlight of these adventures was setting up a show in Rome at a mathematics festival. Yes, *festival* is the right word. The goal was to show students that there are exciting careers in mathematics, e.g., physicist, economist, computer scientist. I got to witness people's first impressions of Escher's art and watch their faces as they discovered the impossibility of works such as *Belvedere*. (*Impossible* sounds so much better when exclaimed in Italian!) Thanks to a generous invitation, my girlfriend and I went out to dinner with some of the speakers—including five Nobel Prize winners. We shared a table with the now deceased John Nash—the inspiration for the movie *A Beautiful Mind*—and his family.

Escher belonged at that table of aging geniuses. Very few artists can make the claim that they continued to create better compositions with every passing year. Many artists, like many Nobel physicists, achieve acclaim for work they did in their 20s. Then they spend the remainder of their lives reliving, recreating and minutely tweaking the ideas that brought them recognition. But not Escher. He created *Belvedere* at age 60.

I hope I can say I'm doing my best work at age 60. I think I know how Escher did it. He never stopped exploring new ideas. He wasn't afraid to solicit others' advice. And he was patient enough to make sure everything he did was done as well as he possibly could. Sounds like a perfect recipe for success in medicine, too. ◇

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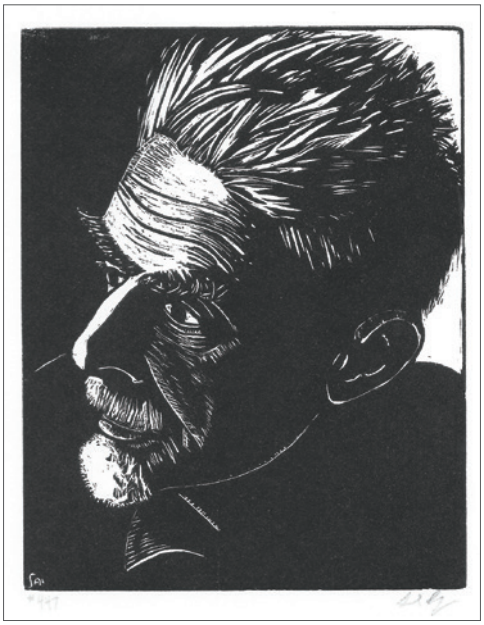
**Belvedere** ***(1958) is one of Escher's "impossible buildings." The entire building is based on the impossible cube the man at the lower left is holding. As with the cube, the top half of the building alone is entirely possible, and so is the bottom half. Only once pieced together does the building defy the rules of logic. Incidentally, the figures in the scene are borrowed from Hieronymus Bosch's triptych*** **Garden of Earthly Delights.** ***The background scenery is that of the Morrone Mountains in Abruzzo, Italy. Italian scenery continued to decorate the background of Escher's lithographs decades after he left Italy, where he lived for much of the 1920s and '30s.***

*All images ©MC Escher Foundation. For more information, or to purchase original prints, visit www.eschersite.com.*

## A Hands-on Exploration of Escher's Art

Sal Iaquinta, MD

MY FASCINATION WITH ESCHER'S ART made me curious to know how difficult it is to create a woodblock print. So I decided to try making some of my own. I bought woodblocks and engraving tools and, like Escher, I drew an exact mirror-image of the final print I was aiming for onto the block. Escher said carving was the relaxing part—nothing being left to the imagination. As in an operation, every move must be plotted out. And every move must be executed without error. In the case of a woodblock, any extra wood removed means the print will have a white spot where there should be color.



*Portrait of M.C. Escher,* woodcut
by Sal Iaquinta

I could agree that carving was relaxing, but printing sure wasn't. I printed using the same techniques that Escher did. I rolled the ink onto the block and put a piece of handmade paper onto the block. I then rubbed the paper with a wooden spoon, pressing hard to get the ink to transfer off the wood and onto the paper. Very laborious, but rewarding.

My modest success with woodblocks, however, did not inspire me to delve into the complexities of lithography. ■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# Novato Community Hospital

David Thompson, MD

It is a pleasure to provide my Marin County physician colleagues this update on Novato Community Hospital (NCH). I am pleased to be a member of a medical group that has served at NCH for 35 years. I started as a part-time emergency department physician in 2003. By 2008, I had become so committed to NCH and the Novato community that I moved my family here. Our oldest daughter begins kindergarten in the local school system this year and we are looking forward to our two boys following her.

An exciting development at NCH is the largest reorganization in the 100-plus-year history of the health system of which we are a part, Sutter Health. This reorganization has created One Sutter, changing our structure from five regions to two operating units: Sutter Health Bay Area and Sutter Health Valley Area. This redesign better aligns us with the way our patients access care. It also streamlines decision-making and keeps the organization flexible and united: One Sutter.

*Dr. Thompson, a member of the Marin Emergency Physicians Medical Group, is Chief of Staff at Novato Community Hospital.*

The new Sutter Health Bay Area operating unit comprises not only Novato Community Hospital but also the Sutter hospitals, medical groups and surgery centers throughout Alameda, Contra Costa, Lake, Marin, Napa, Santa Clara, Santa Cruz, San Francisco, San Mateo and Sonoma counties. Our patients benefit from a consistent, uniform focus on safety, quality and service.

The One Sutter concept is of particular value to our medical staff because it strengthens our ability to leverage the expertise and specialty knowledge of the entire Sutter Health network on behalf of our patients. An example is our relationship with the California Pacific Medical Center (CPMC) Neuroscience Institute. Its telemedicine stroke intervention program enables us to link a stroke patient in our emergency department with a neuroscience physician in real time, 24 hours a day, seven days a week. We can thus provide an expert diagnosis and treatment plan on site as well as determine the best follow-up care. Many residents of our community have benefitted from this service over the past five years.

A piece of stroke-related good news: NCH is proud to have achieved its second Joint Commission Advanced Certification as a Primary Stroke Center earlier this year.

Sutter Health and NCH are learning organizations that continually engage physicians and employees in the Quality Delivery System (QDS) based on the Toyota lean organization model. QDS helps focus us on error-free, efficient health care for every patient. It succeeds because it puts the power to improve in the hands of the people who actually do the work.

A major advantage to practicing at Novato is the close working relationship between physicians and clinical staff. Current projects include removing barriers for nurses so they can spend more quality time with patients, streamlining the process for total joint replacement patients, improving patient education materials, and devising new ways to help patients understand their medications.

Another piece of good news came in July when the Centers for Medicare and Medicaid Services (CMS) ranked NCH one of just 548 out of the nation's 3,500 hospitals—the top 15%—to earn

five stars for the year ending Sept. 30, 2014. CMS bases these rankings on the Hospital Consumer Assessment of Healthcare Providers and Systems surveys.

Over the last two years, NCH has been building its Bone & Joint program in concert with a three-year CMS pilot research project, a bundled payment initiative. In connection with this project, the eight orthopedic surgeons on our staff have formed a best practices group that regularly meets and shares experience and expertise to improve patient outcomes for lower extremity total joint replacement. The hospital also collaborates with home health agencies, rehabilitation and physical therapy centers to coordinate and monitor patients' care for 30 days following discharge. As we enter the third year of this project, we are meeting and exceeding CMS benchmarks for cost control, quality and efficiency. This has enabled us to gain-share Medicare savings with our physicians. Best of all, we are achieving high levels of patient satisfaction and outcomes. We feel fortunate to have had this pilot project experience before CMS mandated a similar initiative for all Northern California hospitals in 2016. In fact, beginning in October, we have partnered with our primary care community to expand bundled payment initiatives to our sepsis and pneumonia patients.

This summer we launched a new component to the front end of the NCH Bone & Joint Program for joint replacement patients with Body Mass Index (BMI) ratings in the overweight and obese ranges. Orthopedic surgeons refer their surgery patients to this six-week evidence-based course called Let's Get Fit. The director of the orthopedic service line, Jennifer Lehr, PT, oversees the course with the assistance of a registered nurse and a registered dietician. Participants receive one-on-one assessments and goal setting, nutrition counseling, exercises to relieve joint pain, and post-surgery follow-up. We are now measuring the impact of the program on these patients.

At NCH, we continually look for technological innovations in health care to meet the needs of our community. We are fortunate to have a committed group of citizens dedicated to strengthening the hospital's ability to provide the best possible services close to home. This year our philanthropy organization is working to raise $250,000 to put toward a dollar-for-dollar Sutter Health matching grant. With these funds, we intend to purchase the most highly developed breast cancer screening technology available anywhere. With our new digital tomosynthesis system, we will be able to offer Marin and North Bay women this groundbreaking breast-imaging technology within the next year.

***NCH physical therapist Diane De Costerd works with total knee replacement patient Andy Priest.*** *Photo by Bob Minkin.*

We take our mission as a community hospital seriously and are committed to putting our mission into action to enhance the health and well-being of the people in the communities we serve.

An example of our community benefit program is our longstanding partnership with Novato Unified School District. For more than two decades, we have funded a health partnership with NUSD to provide health care for underinsured students. Every year we pay for eye exams and prescription glasses, dental work and other specialty medical care.

We expanded our partnership two years ago by hiring and placing registered nurses in classrooms that have students with acute health care needs. This makes it possible for students with type 1 diabetes, spina bifida and chronic epilepsy to attend school with their peers.

During summer vacations, we provided RNs for both the Marin YMCA Summer University for ESL students and the Boys & Girls Club Summer Camp in San Rafael. As a bonus, one third-grader we support during the school year was able to go camp for the first time in her life because her nurse was there.

This fall we further strengthened our NUSD partnership by hiring and placing two athletic trainers—one in each of the district's high schools—to assist coaches in promoting a safe sports environment. The trainers are already conducting baseline concussion evaluations of all high school students participating in sports this school year.

With One Sutter, Novato Community Hospital is taking on the changing world of health care with determination and resolve to serve our community and our patients in the very best way possible. We are embracing change and constantly learning to use it to best advantage for our patients. ◇

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# Burning Man Reflections

Mark Taylor, MD

La Contessa, *Burning Man (2002)*

My first trip to Black Rock City—aka Burning Man—came in 2002. The theme that year was "The Floating World." Since 1996 themes at Burning Man have inspired art, costume and design while allowing participants to role-play and explore.

I will never forget my astonishment at seeing *La Contessa* drift across the playa as if she were afloat when in reality she was a faux Spanish galleon riding atop a school bus. Some aboard were dressed in complete swashbuckling regalia. Others flashed Hawaiian shirts and bikinis. *La Contessa* was spectacular—on par with any float I have witnessed at the Rose Bowl Parade or Rio's Carnival (on TV). But this mutant vehicle was open to the public. Anyone could hop a ride, not just the anointed entertainers, dancers or beauty queens. *La Contessa* was our float, a float for the people, a float for participants, a float for "burners." And best of all she was not alone. Hundreds, if not thousands, of other mutant vehicles or "art cars" shared the playa on the dry bed of Lake Lahontan.

I have now attended 12 Burns in 13 years, and my astonishment never abates. I believe the element of surprise is what keeps me returning despite the difficulty of negotiating time off from work and family as well as risking the ridicule of other professionals who may see me as just seeking out a "big party in the desert." While there certainly is a party, that is not what keeps most participants returning year after year. For me it is the "fascinoma," for the same reason that fascinomas are what make medicine most interesting. The practice of a hospitalist is relatively routine. It's the unexpected outcomes and discoveries that are most engaging. When physicians write case reports, most, in my experience, tend away from bread-and-butter issues unless they go strangely awry. We almost always choose to share a "zebra" over a "horse."

Burning Man produces "zebras" aplenty as well as some very large "horses." The 28-ton *Black Rock Horse* of 2011 (see page 37) stood 52 feet tall on four giant wooden wheels and contained a hidden door in its hind leg with stairs to its hindquarter, belly, "oracle room" and headquarter. Throughout the week participants could climb into its body, where they might find a "Trojan" princess and/or warrior sipping absinthe in its Green Belly Lounge. At night, red electroluminescent ("el") wire outlined its frame, creating a 5-story landmark. Then at week's end, hundreds of volunteers ceremoniously rolled this breathtaking performance art piece to its final stand before it was burned to the ground in a prelude to the next night's "Burn of The Man."

Over the past decade I have experienced hundreds of awe-inspiring art pieces mixed with performance. There is so much to see and do that even a week is not enough since many pieces undergo transformation from day to night. I experienced a sympathetic surge of goose bumps upon first viewing Marco Cochrane's *Bliss Dance*. This 40-foot sculpture of a dancing female—made of geodesic struts with a skin of steel mesh and filled with multicolored LEDs—seemed every bit as powerful as Michelangelo's *David*. Furthermore, I was able to view her, unlike *David*, throughout the week both day and night, sunrise and sunset, with LED cycles of color and reflections of sun and moon continually transforming her strength and beauty.

Burning Man provides art you can see, touch, hear, smell and even taste. You can dance, climb and drum on many pieces.

*Dr. Taylor is a hospitalist at Kaiser San Rafael.*

Bliss Dance, *Burning Man (2010)*

Opportunities like that do not exist at the Met, MOMA or Guggenheim. From the sky above Burning Man, the Black Rock Desert seemingly frames a flat, off-white canvas painted and textured, a collage of humanity. Though it's a barren, ancient wasteland too alkaline to sustain life, the playa serves as a canvas for art that is alive. Transformed by creativity, it can intoxicate even the most sober, rational physician.

Burning Man's origins in chaos are legendary. The first burn—on San Francisco's Baker Beach in 1986—was the unsanctioned ignition of an effigy created by Burn founder Larry Harvey, a self-portrayed unemployed bike messenger, and his friends. Soon the event, replete with members of the Cacophony Society, was kicked off the beach, taking a year to find a new home in Nevada (1990) where pyrotechnics met no law enforcement interference. Very few rules existed on the playa in those days. Locals commonly used the area to drive "like a bat out of hell," shoot guns and blow things up. This tradition was not lost on early burners, many of whom were known to enjoy the hijinks of a virtual Wild West. One lasting tale is of a drive-by shooting range where participants on any form of wheels were challenged to shoot live ammunition into tumbleweed and other random targets. I recently watched a video of a young man on a bicycle rattling off lead from an old-style six-shooter. There was certainly something very renegade and outlaw about those early Burns, which succeeded only because of their participants' radical self-reliance.

Burning Man today has structure and rules of conduct. Guns are no longer permitted, nor are pets, personal fireworks and/or defecating on the playa. Port-o-potties number over a thousand. Once you park your car you may no longer drive unless you are leaving. Mutant vehicles are the exception, but only if driven no more than five miles an hour and neither entered nor exited while moving. To receive a sticker authorizing day and/or night travel, they must also pass DMV (Department of Mutant Vehicles) inspection for safety and art-worthiness. Drivers may not be under the influence of drugs or alcohol or within reach of an open container.

This is not to say that art cars may not dispense alcohol. Many are bars on wheels, complete with deejay, band and dance floor. One of my many memories of the playa includes a wedding reception on the Black Light Lounge, a converted Muni bus without windows or roof sporting a deejay station on a bare metal frame above the driver with a bar abutting its left side, dance floor on right and lounge in back. We started the evening listing one foot

to port thanks to the mass of 1.75-liter bottles of gin, rum, tequila, vodka and whiskey. By sunrise, the bacchanal was over and the "lounge" was again riding flat.

People of all ages attend Burning Man. Consequently those who run a bar on the playa today must check IDs. Law enforcement abounds and is not above enlisting attractive underage burners to ask for a drink. Theme camps have been shut down and individuals fined for serving a charming minor. While drugs are present, even medical marijuana is illegal at Burning Man since it takes place on federal land. There is a famous story, whether true or not I do not know, of the arrest of an unsuspecting "chronic" by a naked yet "undercover" DEA agent who had asked to be "gifted" some bud. The generous pot-head ended up with a hefty fine for possession and was left cannabis-free for the rest of the week. Despite Burning Man's image as a drug fest, alcohol remains the most-abused substance on the playa. This is not to say that narcotics and psychedelics are not present. Those who use them can always find company.

One of my most distressing memories is of taking a tour of Rampart, Burning Man's central emergency services installation, which provides free health care including lab, x-ray, and a limited pharmacy staffed by Nevada-licensed physicians. As I entered the structure (think MASH unit) I witnessed a young man unconscious with doctor and staff attempting intubation. Later I heard he had died of an unintentional overdose. Fortunately, despite a population of 70,000, death is rare at Burning Man. Fatalities over the years have come from a plane that crashed after stalling over the Black Rock City landing strip, "suicide by hanging mistaken as performance art," and a bus striking a 29-year-old gallery manager. On the other hand, every year thousands are treated for mild to moderate injury or illness at no cost to patient either at Rampart or two other emergency services installations that provide basic first aid and hydration. The seriously ill are transported by ambulance to Reno, 120 miles away. Sadly, as might be expected in a city of 70,000, sexual assault has been a problem and is likely underreported. Further confounding accurate documentation is the fact that evidentiary exams must be conducted in Reno and many victims choose not to leave the playa for evaluation.

Black Rock Horse, ***Burning Man (2011)***

While I do not work in an official medical capacity on the playa, I do serve as my camp's medic. However, even in a camp of over a hundred people, rarely do I get called into action. Most of my consults are for minor injury first aid and some chronic ailments. Many are just a primary-care second opinion: "I have this (fill in the blank); what do you think?" Rarely have I had to send camp members to emergency services, and fortunately those I have were easily treated. For instance, I transported a camp member on the *Boss Hog* (our camp's sheet-metal porcine mutant vehicle borne on a Volvo chassis) to Rampart for splinting of a non-displaced proximal fifth metatarsal "dancer's fracture" suffered while singing karaoke at Spanky's Wine Bar the night before.

Injuries are bound to happen in a city that is constructed, often explored on bike, and then dismantled all in a week's time. The Burning Man *Survival Guide* has helped educate burners against previously common injuries such as stepping on uncovered rebar tent stakes or developing "playa foot" from wandering barefoot on ground with a pH of 10. Burning Man's pioneering daily periodical is named *Piss Clear* in an effort to remind people to stay hydrated in the desert heat. Center Camp, a giant shade structure built by the Burning Man organization, was conceived and designed with safety and community in mind. Here people may find shelter from days exceeding 100 degrees and nights approaching freezing. Additionally, Center Camp Café sells coffee served by volunteer baristas and nearby Camp Arctica sells crushed and block ice for three dollars a bag. Ice and coffee are the only two commodities for sale on the playa. Everything else consumed at Burning Man is free, gifted between participants. While bringing one's own food and water for the week is a must, it may also be possible to occasionally sustain oneself via "movable feast." I recall mornings spent biking from Pancake Camp to Bacon Camp and then to the French Quarter for an espresso. Exchange of money is prohibited and bartering is no longer a norm. Those cooking for and serving participants expect only thanks and an occasional hug and kiss of gratitude.

Some complain that the ticket price of $390 per individual and $40 per car is too high and that the limited number of advance tickets for $800 is outrageous. I believe that the free medical care and port-o-potties alone are well worth the price of admission, as is the employment of a growing cadre of full-time paid professionals for operations, planning, surveying, construction and cleanup of Nevada's sixth-largest city—for one week a year. In fact, prices would likely be higher if slogans such as "if it didn't come from your body, don't put it in the potty" didn't prevent port-o-potty contractors

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Thanks to MMS, CMA and other medical associations, recent attempts in Congress to cut the Medicare reimbursement rate have all been rebuffed.

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MMS and CMA work diligently to protect the Medical Injury Compensation Reform Act (MICRA), which safeguards low liability insurance rates for California physicians.

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### 9 STAYING IN TOUCH
Through their magazines, newsletters and websites, MMS and CMA encourage physicians to stay in touch with each other and with current medical news and events.

### 10 IT'S EASY AND FUN
To join MMS and CMA, go to www.cmanet.org/join. Once you belong, it's fun to get involved in medical society projects and events.

## ASK YOUR COLLEAGUES ABOUT MMS AND CMA

One of the best ways to learn more about the benefits of membership in MMS and CMA is to ask your colleagues. The physicians listed below have leadership roles at MMS and would be happy to take your call.

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from repeatedly blowing their pumps. Other fees (2014) include: $4.5 million to the Bureau of Land Management, $1 million for heavy equipment, $300,000 for local agencies and law enforcement, $500,000 for medical services, $1 million in art grants and a million more for taxes and government licensing fees. Ticket prices, we are told, merely keep pace with the inflation of these fixed expenses. The truth is: Burning Man would not exist without volunteers and the generosity of participants. Most art is not fully funded. Theme camps are self-supported. Mutant vehicles are created by garage-tinkering engineers and mechanics. Burning Man is truly of the people, by the people and for the people. Its 10 principles—radical inclusion, gifting, decommodification, radical self-reliance, radical self-expression, communal effort, civic responsibility, leaving no trace, participation and immediacy—make it a one-of-a-kind event and an inspiration for all who dare attend.

Over the past decade I have taken the 10 principles to heart both on the playa and at home. I have explored my creative side by playing drums and percussion, having been gifted my first set of congas in medical school. On the playa I have performed with fire dancers surrounding *The Man* on Burn Night. At home, I have played in local bars and restaurants throughout Marin. What started for me as an opportunity to blow off steam "banging a drum" between call nights and daily rounds has evolved into a personal fulfillment of the principles of radical self-expression, immediacy, participation and communal effort. I believe my life is enriched by a Burning Man ethos, which I try to share with those I care for, work with and perform for.

Burning Man is what you make of it. First-timers quickly learn that the more they give, the more they receive in return. Participation is a must. Burning Man exists because people share of themselves, explore, create, take chances, try new things and meet new people. Some have referred to Black Rock City as a place where the walls that usually separate us are stripped away. The environment alone pushes many out of their comfort zone. Most quickly learn that they are part of the event, not mere observers. The chance to be periodically awestruck by musical, personal and artistic "fascinomas" keeps me wanting to return for more, despite dust and heat and a drive that can take 12 or more hours from the Bay Area, including 4–6 snail's-pace hours crossing the last 10 miles on playa in stop-and-go traffic past gate and greeters. Most burners, however, take the trip in stride as "the Burn starts once you leave your front door" in a vehicle buried beneath a week's worth of food and water, camp necessities of shade and light, chairs and tables, costumes, and the requisite bicycle to cross its seven square miles—in addition to whatever gifts you plan to share with those you meet.

How many days till the next Burn? ◇

*Email: mark.r.taylor@kp.org*

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MMS: WORKING FOR YOU

# House of Delegates 2015

Peter Bretan, MD

More than 500 California physicians convened in Anaheim Oct. 16–18 for CMA's 2015 House of Delegates (HOD), the association's annual meeting. Marin county, part of the tenth district, which also includes Sonoma, Solano, Napa, Lake, Mendocino, Humboldt and Del Norte counties, was represented by **Drs. Peter Bretan, Lori Selleck, Irina deFischer, Larry Bedard, Michael Kwok** and **Jeff Stevenson.**

Upon the close of the HOD, new governance reforms took effect that will allow CMA to be more nimble and effective in making decisions on issues critical to physicians. The new rules will also accommodate the submission of resolutions from individuals throughout the year, rather than just once annually, which will make it possible for CMA to react quickly—through its elected Board of Trustees—to critical issues in real time. This approach makes it possible for individual members to participate in and influence CMA policy-making in a more timely way, rather than waiting for a once-a-year opportunity at HOD, CMA's previous tradition.

Following are highlights of the actions taken at this year's meeting:

*Dr. Bretan, a urologist in Marin, Sonoma and Mendocino counties, is president of MMS, on the CMA and AMA delegations, and a former CMA trustee.*

## Tobacco (RES. 107-15)

CMA reinforced its long-established stance against tobacco use, with the passage of a resolution that strongly objects to pro-tobacco efforts by the U.S. Chamber of Commerce in other parts of the world. With the resolution's passage, CMA calls on the Chamber to immediately halt all advocacy efforts on behalf of tobacco companies and urges all conscientious companies that are members of the Chamber to either take similar action or quit their membership to protest such anti-health efforts.

## Public Health Funding (RES. 112-15)

The delegates voted unanimously to urge the State of California to restore public health funding. The resolution calls on CMA to work with state health and legislative officials, through the state budget process, to develop a plan to repair California's public health infrastructure and funding for vital prevention services.

## Biomedical Careers (RES. 609-15)

The delegates directed CMA to support pipeline programs targeting underrepresented minority and disadvantaged students, to help increase ethnic minority physicians in medically underserved areas.

## CMA delegates meet to discuss critical health care issues, set policy

### Implicit Bias Training (RES. 610-15)

Acknowledging their impact on patient care, the delegates urged CMA to support studies of the impact on patient care of "implicit bias—defined as the positive or negative perceptions, feelings and stereotypes that impact our comprehension and behaviors in an unconscious way. The resolution also called on CMA to support the inclusion of implicit bias training in medical school curriculums and continuing medical education programs.

### HSA Limits (RES. 411-15)

The delegates passed a resolution directing the association to support increasing the dollar amounts eligible for tax-free deposit into a health savings account (HSA) to cover a greater proportion of an enrollee's potential out-of-pocket costs in a high-deductible health plan.

*To learn more about these resolutions, see the Oct. 19 issue of* CMA Alert *at www.cmanet.org.*

### Hospital Affiliation Requirements (RES. 402-15)

The delegates passed a resolution opposing the health plan practice of requiring physicians to maintain a hospital affiliation in order to contract with the plan. Many physicians, for a variety of reasons, no longer physically practice in a hospital setting. As such, requiring physicians to have hospital privileges at an in-network facility in order to contract with a health plan unfairly penalizes physicians whose practices do not require interaction with a hospital, and potentially reduces access to care for patients, particularly in rural areas.

### Administrative Burdens (RES. 404-15)

In an effort to reduce the administrative burdens on physicians, the delegates passed a resolution that supports a requirement that each health plan provide a single comprehensive information resource (telephone or online) that can address all inquiries related to benefit eligibility, provider plan participation and service precertification without the provider having to initiate multiple telephone or online inquiries.

### Powdered Alcohol (RES. 104-15)

The delegates passed a resolution directing CMA to encourage an established health research entity to evaluate powdered alcohol products for potential health and societal impacts. The resolution also calls on CMA to advocate for the development of regulatory controls for powdered alcohol products similar to those for liquid alcohol products, including regulation on sales, marketing, product placement, packaging and warning labels. This resolution was referred for national action.

Additional details of the new policies set at this year's meeting are available for members only at www.cmanet.org/hod under the "Documents" tab. ◆

BOOK REVIEW

# No Ordinary Life

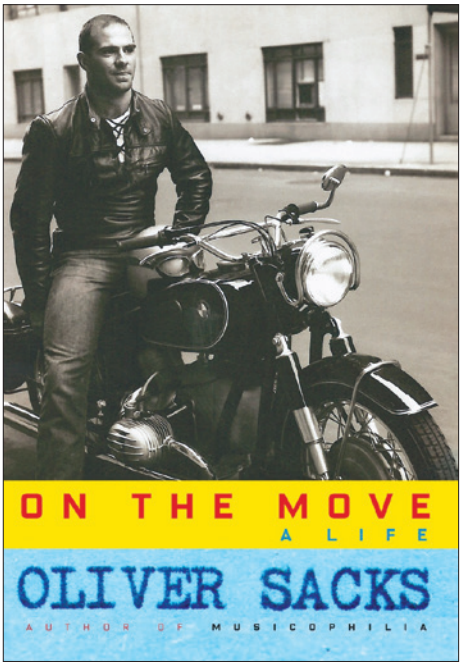
Jeffrey Weitzman, MD

**On the Move: A Life,** Oliver Sacks, MD, Knopf, 397 pages (2015).

I can recall years ago first hearing a sonorous voice on the radio speaking impeccable English in a way that only an Oxford education makes possible. It did not take long to realize this voice conveyed medical knowledge and was in fact Oliver Sacks, the physician Robin Williams portrayed in the film *Awakenings*. Over the years, in 12 books and numerous articles, Dr. Sacks had much to say about neurologic disease and the functioning of the human mind. Since first hearing his voice, I listened to him many times on radio and TV, always finding his voice mesmerizing and his intellectual range broad. But who was the man?

In his recently published (April 2015) autobiography, *On the Move: A Life*, Oliver (I feel he would not object to my calling him by his first name as he was a pretty informal guy) lays out the journey through his fascinating, distinguished life. Some of it, to my pleasant surprise, played out right here in Northern California and Marin County. Oliver was raised in England in a family that had produced a lot of physicians, including both his parents. Oliver wanted to separate himself from this background and find his own identity. He also came to realize that London and, particularly, his family were not accepting of his being gay. These two issues, plus a love of motorcycles and speed, made the lure of California irresistible.

*Dr. Weitzman is an emergency medicine specialist at Marin General Hospital; he also practices geriatric medicine in Marin County and student health at UC Berkeley. He asks any readers who may have had contact with Oliver Sacks during his years in California to get in touch, "especially if they are willing to share some stories."*




Oliver outlines his journey in America—from an unlicensed physician to choosing neurology as his profession and setting up a unique medical practice. His approach to medicine was an intellectual pursuit, both in trying to understand the normal function of the human mind and the dysfunction brought on by disease. He was refreshingly unmotivated by money or power. He was fiercely dedicated to his patients, and they, in turn, were fiercely dedicated to him. His use of dopamine to "awaken" institutionalized post-encephalitis Parkinson's patients was the basis for his writings not only in peer-reviewed medical journals but also in *The New York Review of Books* and *London Review of Books*. These writings eventually led to *Awakenings*.

Oliver realized early that he loved writing, and he may have been unique in publishing case histories of some of his more interesting patients in lay publications. One, *The Man Who Mistook his Wife for a Hat*, received more interest from the general public than from his medical associates, many of whom considered this an ethical breach.

Oliver also indulged in the Southern California beach scene, had a brush with drug dependency and explored his repressed sexuality. A big guy, he became a body builder and competitive weight lifter who at one point held the California state record for squat lifting—600 lbs! A polymath if ever there was one, Oliver was also passionate about swimming and diving, something he could indulge in as he later traveled the world seeking out neurological conditions in isolated populations such as those of Micronesia and Guam.

Oliver eventually moved to New York City to continue his practice and study, often coming into conflict with those who did not agree with his unconventional approaches. Gradually, through his articles and books, he gained national and international fame. He estimated he had thousands of notebooks filled with jotted thoughts and ideas. Some of these he would refer to in preparing talks or writing, but most he didn't. In his own words, "The act of writing, when it goes well, gives me a pleasure, a joy, unlike any other. It takes me to another place—irrespective of my subject—where I am totally absorbed and oblivious to distracting thoughts, worries, preoccupations or indeed the passage of time. In those rare, heavenly states of mind, I may write nonstop until I can no longer see the paper. Only then do I realize that evening has come and that I have been writing all day."

There are some interesting stories in Oliver's book. These include actor Robert De Niro's hiding in his house while learning his role in *Awakenings*. Another centers on Oliver's inclusion with Francis Crick, of Crick and Watson fame, in an intellectual circle of scientists trying to understand

consciousness and thought and the functioning of the human brain. Crick wonders at one point if his medical condition will end his quest prematurely. Unfortunately, Oliver would share the same fate.

Oliver published several articles in *The New York Times* over the past few months. In them, he revealed he had a recurrence of an earlier case of melanoma and was now experiencing physical decline and facing his own mortality. He found love at a late age, and wrote about issues important to him, like being Jewish and celebrating the Sabbath, and his love of chemistry and the periodic table.

Oliver passed away just weeks ago, on Aug. 30. I felt the same sadness I had when I heard Robin Williams passed away. Two people whose careers became intertwined, whom I did not know personally but would have liked to—both of whom influenced others, made them laugh and made them cry. ◇

*Email: jweitzmanmd@gmail.com*

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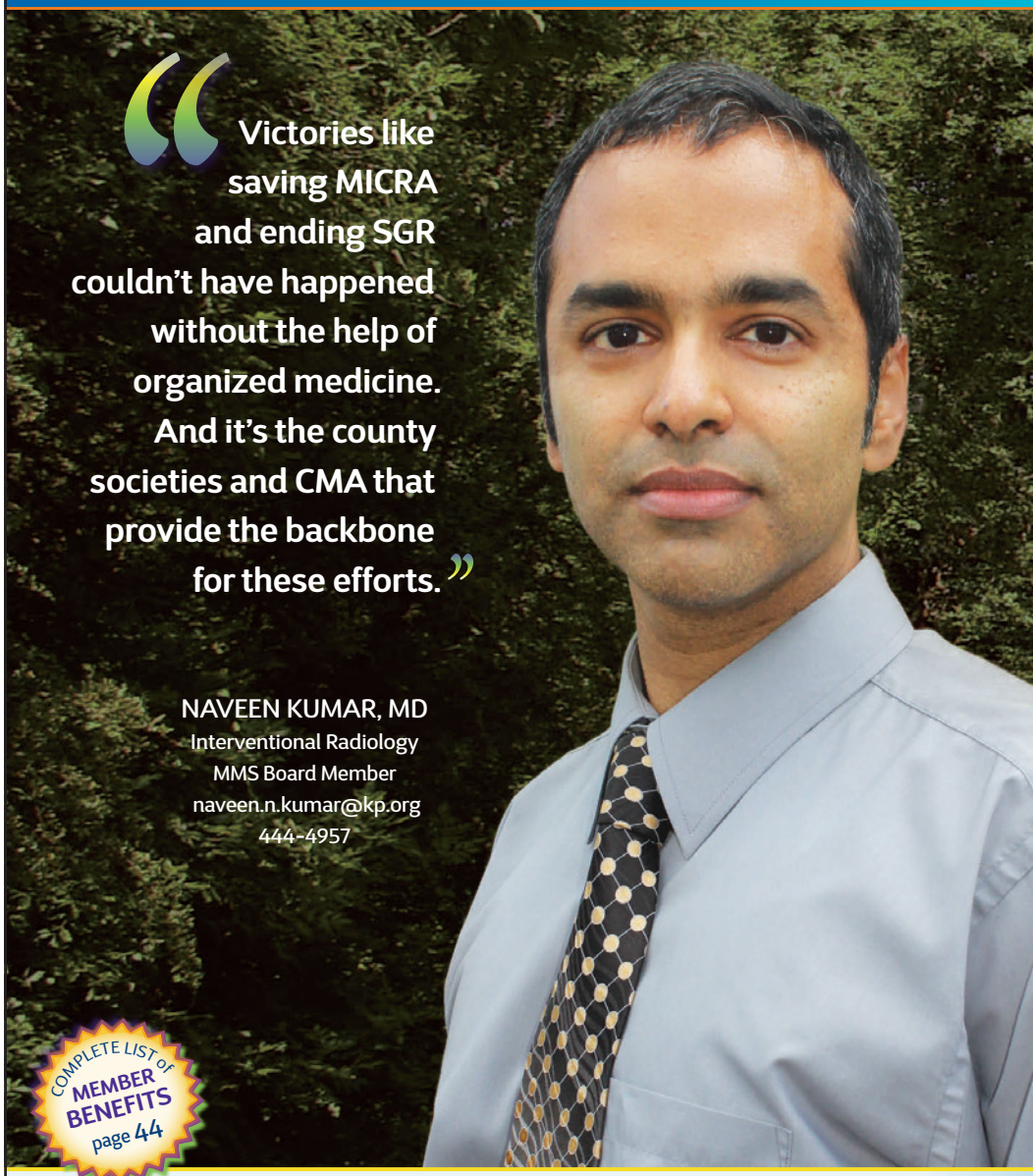
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COMPLETE LIST OF MEMBER BENEFITS page 44

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